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A PLEA FOR THE REORGANIZATION OF THE MEDICAL PROFESSION.[1]

By ARTHUR E. BROWN,
Colac, Victoria.

IN the constant and accelerating conditions of change in modern social life it becomes more and more evident that one social system after another, carried on in traditional fashion, is failing to fit into its changing environment, and that the old preponderance of its advantages over its disadvantages which made it on the whole work, is rapidly diminishing. There comes a stage in nearly every one of these systems when so many people fail to find it any longer acceptable that its alteration becomes inevitable. To this rule our medical system is no exception. For years it has been under the fire of criticism, even while it has continued on the whole to work fairly well, though perhaps to a diminishing degree of general satisfaction. It remains, in fact, an individual occupation in an increasingly centralized and organized age, and it is becoming every day more evident that even those of its qualities which are most widely recognized to be admirable and valuable, will not for very much longer save it from the hands of national organizers and planners.

Our distribution on an economic instead of on a national service basis; the increasing complexity, and hence costliness, of effective medical help in sickness; the growing tendency towards a collective preventive medicine, rather than an individual and curative work; these are factors which we ourselves must recognize as ripe to cause imminent and radical changes in our national medical organization. Judging by the results of discussions which I have had with many of my professional colleagues in the last ten years or more, I feel fairly safe in assuming that the great majority of us do now realize that the old halcyon days of private practice as we and our fathers have known it, are nearing their end. But we have been happy in our individual work, and proud of our traditions, and we are very reluctant—too reluctant, I think—to face this fact as it should be faced. In our desire to cling to the traditions of our past we are in danger of losing the chance of wisely shaping our future.

I believe that we are on the eve of very drastic changes in medical life—changes that were rapidly approaching in any case, and that will be much accelerated by the war and its consequent reorganizations. I am very much afraid that they will be brought about by persons and bodies unsympathetic to our ideals and traditions, and ignorant of the real needs of the public in medical service. I think it likely that instead of one great frontal attack on our position we shall be beset from all sides by incoordinated and overlapping plans and organizations, each in its small way perhaps estimable, but altogether incomplete. Every one of these will put us in such a position that we shall feel unable to make a wholehearted resistance to it without appearing purely obstructive; yet every one will sap our economic independence, destroy our professional unity, and, worse, cause us under the squeeze of hard pressure to discard our professional traditions and ethics, until finally all that is good in our present medical profession has been destroyed and no complete framework for the building up of a new one has been laid down.

There are three main sources from which these assaults on our position can obviously originate: industrial and commercial units, hospital organization, and direct political action.

For the first source, I do not myself believe that it will prove a major force in this country, although, according to Glenn Frank, the development of industrial medicine has gone a fair distance in America. But as an illustration

[1] Read at a meeting of the Victorian Branch of the British Medical Association on June 5, 1940.

of what I mean let me point out to your notice the very possible results of such legislative steps as the recent *Workers' Compensation Acts*. By these we undoubtedly receive payment for a great deal of work which before we had to do for nothing; but they have also had the effect that we receive now a definite proportion of our incomes, not from our patients, but from insurance companies. Any further development along these lines will increase this proportion, and if it became at all considerable the companies, being to that extent our paymasters, could, and would, interest themselves very greatly in details of treatment and fees charged, and could attain a very definite power over us. I do not think the actual importance of this development should be magnified; but it is apt as an illustration of a social trend. Possible further exploitation of this trend, together with the development of factory and industrial unit medical services, does constitute a factor which no one thinking over the future of our profession can afford to disregard.

The second of these sources of reorganization is a more obvious one. Hospital services are so closely linked with medical services in the matter of equipment, staffing and costs, that it is evident that in any truly planned national service the two must be laid down on parallel lines and their central controlling authorities closely coordinated in one way or another. In this country, and in this State, the hospital services have got a long start on the medical services in the matter of planning. The interval between the two great wars has seen general recognition of the fact that the old individual charity—locally conceived, locally founded, locally managed and locally financed—must give way to a hospital system designed to serve the increasingly complex needs of the community. The hospital service has in fact been changed from an individual and local service to a national and State-wide service, with finance and management increasingly in the hands of a central controlling body. That development is still quite obviously in its early stages. It is evident that the financing of these hospitals is going to become more and more, and eventually entirely, a function of the central government; and step by step with each increase in the proportion of the finance which they supply, the governments, through their appointed boards, have taken, and will continue to take, an increasing share in control. In the latest hospital acts in this State, not only is the Government directly represented on the committees of management, but the appointment of secretaries and managers is now subject to the approval of the Charities Board. Hospitals will soon be nationalized in fact; and who will suppose that the medical staffs will be left untouched by this? Even before this there has been the evidence that such must be the case, in the regulation enforcing on base hospitals the appointment of members of specialist staffs bearing higher degrees. Further topographical development of out-patient services (clinics and dispensaries in the cities) which has already been foreshadowed, will make further demands on our free services, if we give them; or, alternatively, it will create a further large number of medical men in the pay of hospitals. I shall mention only the alteration in our position which will occur if we abandon the voluntary public hospital service, which we already feel to be becoming somewhat of a burden on us, and accept salaries from the hospitals. With an energetic and efficient central controlling body further developments in hospital services, bringing changes in our status, must obviously come. And at what stage shall we be justified in standing against them?

Purely political interference with our *status quo* can be carried on on a very broad front—in fact, on a number of fronts. Wherever there is a weak spot in our system of service it can, and will, be probed by political action. The appointment of State-paid medical men to sparsely settled districts (as in Tasmania and New South Wales) and the recent arguments about the registration of alien refugee doctors indicate a sense on the part of State governments that they should interfere in the matter of the geographical distribution of medical men. The recent attempt to bring about a national insurance scheme shows that the Federal Government is concerned with the supply and cost of medical service. The talk among sections of the political world of the socialization of medicine *in toto* as an immediate political aim is not idle talk. Whether the reorganization is considered likely to come *in toto* or piecemeal (through the extension of public health services or of auxiliary schemes, such as school clinics, infant welfare centres, bush nursing schemes or what not), it appears to me that none but a blind man could seriously regard the maintenance of the *status quo* as a reasonable objective for the medical profession to aim at.

We cannot with either dignity or success hold to the maintenance of our present status as our objective in meeting these attacks upon it. It is a foregone conclusion that if we present nothing more than a sturdy front to the constant assault of social change we shall lose first the sympathy and then the respect of our fellow citizens. I think our work and our worth have always been too high in public esteem for us ever to come to be regarded as public enemies; but it will be just as disastrous for us to come to be regarded as public obstacles. Not one of the movements so far made outside the profession towards the correction of weaknesses in our service is in itself a bad movement. Many of them are admirable, though disconnected and overlapping; yet our attitude towards them must be either one of surrender covered by the old formula of "safeguarding our interests" or one of opposition on the grounds of our interests alone. Neither of these will gain us respect in the public eye or in our own. And yet we rightly fear for the future of our own profession, in which the highest possible standard is an essential condition of the public welfare. We can see each one of these steps as an encroachment on our economic independence—an intensification of competition, whereby our ethical and professional standards are increasingly endangered. We know that it is not in these piecemeal and incoordinated movements that the real welfare of the profession and the public lies. Still less is thoroughgoing political reorganization through the usual parliamentary channels likely to produce a service that will be anything but disastrous—at least in its first decade or two. But we shall retain neither dignity nor self-respect if we adopt a purely defensive and obstructive attitude towards all these things. Nor even shall we achieve success; we shall find ourselves in the position of an army with both flanks in the air and its base threatened, which has finally to surrender unconditionally to an opponent who has lost the respect he had for it when the campaign opened.

We can, however, take a hand in moulding the future of the national medical services ourselves. We can, and I believe it is essential that we should, think out a plan in which our knowledge of disease, of sick people and their needs, of the problems of health and its preservation, and of the relation between doctor and patient will assure us of a rational basis for the evolution of a really good national medical service. And having done that, we can, and should, refuse to accept or tolerate the half-measures and interferences which will cripple the present service without supplying the basis for a new one. We can do that with strength and justice and in a sense of right. And I believe that that is where the duty of the leaders of the profession lies at the present moment.

I believe that we as a profession, expert in our work and realizing its place in the social scheme, should produce and sponsor a plan which will really satisfy the needs of present-day society and be capable of satisfying the changing needs of the future. No such plan should consider any interest other than the ultimate public welfare. It must also recognize that the quality of any medical service is the quality, first, of the men composing it, and only secondarily the quality of the technical organization evolved.

Therefore our plan must be based on three main points: (i) The reorganization must be radical, complete and thorough, built up with the sole idea of providing as perfect a national medical service as it is possible to build up. (ii) The new medical service must be able to attract to itself a selection of the best and most alert of the boys passing from school to university. It must offer them a reasonable career in terms of money, and sufficient

liberty of thought and action to keep the minds of such as are capable of development from stagnating and becoming fossilized. (iii) It must be wisely and sympathetically governed by men steeped in the professional tradition of pride in ability and in service, so that this attitude of mind may be maintained in the new service as it is now in the majority of the members of our profession.

In suggesting such a plan to your notice I wish to emphasize that it is neither original nor new to me. A quarter of a century ago an English medical man, named, I think, Bernard Moore, wrote a book called "The Dawn of the Health Age", which I read shortly before the war of 1914. It made a deep impression on my mind, and though I have never seen or heard of the book since, and cannot quote from it even broadly, it has coloured my thinking on medical organization ever since. It was a plea for the complete organization of the profession from student years to the retiring age under the guidance of a central body composed of medical men. The basis of such an organization was to be the following objects: the more efficient service of the public, the maintenance of the highest professional standards, the constant pursuit and application of knowledge, and the removal on the one hand of the financial interest of doctors in illness, and on the other the lightening of the financial penalty imposed on patients by illness.

It will be evident to you that I can lay such a scheme before you only in the broadest outline and that this is not the time for discussion of detail in any sense. It is the principle which I submit to you. One recognizes well that no scheme works out in practice in the same way as it appears on paper, and also that the essence of the whole is wise guidance and control from the top. One must assume that the achievement of such wise guidance is possible. If it is not, the position of our profession is hopeless, for the evolution of medicine in the future in almost any direction that can be foreseen presupposes some form of central control. With some boldness, then, and with a reasonable degree of optimism, I can proceed to lay down the basic principles on which such a scheme of reorganization as I have in mind could and should be carried out.

Let me start by saying that any competent medical service could be properly handled only by a central body invested with the authority of government, but not subject to political pressure in its endeavours to produce and maintain an efficient organization. Such a principle is recognized and works very effectively in the case of the State Electricity Commission of Victoria. Further, as the scope of their control must include such highly technical matters as the education and training of students, research, equipment, clinical records and supervision of professional methods, the appointment and promotion of men according to their professional ability and the maintenance of tradition and standards of knowledge, it is essential that this body should include a considerable proportion of medically trained men of high repute.

The next important step is that doctors should be trained in accordance with the needs of the service, and not, as at present, in accordance with their hopes of making a living. To this end one supposes a survey of the population and its medical needs. It should not be difficult to establish the number of doctors actually required for the efficient service of the public. This number may be greater than the number of those at present practising; or with a more efficient distribution it may be the same, or possibly even less. But the number once established and the suitable age for retiring from the service being decided upon, it should be easy to fix the number of vacancies likely to occur in any one year. These vacancies should be applied for by boys leaving school, and the applicants should be subjected to some form of eliminating test, so that the best, as far as it is humanly possible to pick them, would be chosen to enter the service. Eliminating tests are very subject to criticism I know; but to mention only one example which was well conducted and strikingly successful, the old Indian Medical Service was a case in point; admission to this was a cause for pride, and the standard chosen remained very high for many years.

The training of these boys should be the responsibility of the service and should not be an expense to their parents. This principle has been, I believe, adopted by at least one of the greatest English industrial concerns and has been very valuable in getting boys of ability and enthusiasm into their ranks. Of the nature of the training there is much that might be said, though I do not feel that this is the place to say it. The basic sciences and the preclinical stage would probably be arranged through the university as at present, though simplified somewhat, and, it is to be hoped, with the months-long vacation eliminated. The clinical teaching might well be carried out entirely by the various hospitals allotted to teaching work, whereby a much greater degree of apprenticeship might be achieved than is the case at present. This, however, is by the way; and one need only assume that by whatever system of training is evolved the youths arrive eventually at graduation. From then on they would become salaried officers of the medical service and would remain so until the end of their working years, when they would retire on a pension. During those years a man would pass from post to post, in the earlier stages automatically, in the later ones according to his known and observed ability. Some such career as this might be laid down. His first post would be a resident hospital position, first as junior in a teaching hospital, then as senior, much as at present; his next step would be a term as assistant to senior men in general practice; his third, an independent post in a small centre under the supervision of senior men and in touch with a hospital. This year I think is important. He is in personal charge of a district. He has to work largely alone and to rely on his own initiative. He breaks the academic crust which surrounds him in his teaching hospital. He learns the taste of hours in which there is not much to do, yet the need to keep alert so that he may not be caught napping by the unexpected is ever present. He is expected to keep in touch with all patients he sends into the district hospital, personally to discuss their conditions with the medical man in charge of them, and to resume the care of them on their discharge. He is expected to attend staff meetings at the hospital and generally to keep in touch with the centre; and his abilities and his attitude towards his profession generally are noted and recorded by the head of his district. During all these stages his work is under close supervision, but his contact with his patients is direct. Following on them I imagine a return to a teaching hospital for serious post-graduate work, which might be for a year, more or less, but of course still on salary. This should consist of solid clinical work and teaching, with lectures and laboratory work on such advances in the basic sciences as affect medicine. During this year he would decide, or it would be decided for him, whether he would go on, as the majority would do, in general practice or would enter a specialty. When he left hospital again he would be appointed as junior member to a group working in a clinic or a hospital, in city or country; and his professional career from then on would depend on his qualities. Laziness or incompetence would bring him to a halt on a comparatively low plane of responsibility and salary; energy and ability would bring him the maximum of these which he could reach. The course of those whose peculiar capabilities led them up the path of specialization to consultant rank would be similar, with its obvious variations. The education of all members would be continued and the spread of advanced methods of treatment and diagnosis would be facilitated by short resident post-graduate courses every year.

Such a scheme presupposes the entire abolition of fees between doctor and patient and the substitution of salaries. I feel that this is an absolute necessity for any planned national medical service. It may be found that fees are necessary in some cases as a deterrent to frivolous calls and to the overworking of medical men on trivial grounds. If so, such fees should be payable to the service as a whole and should be imposed only for the purpose desired. A medical man in the service should receive a salary, rising with his experience and responsibility to the maxi-

mum of which he is capable, from the day he qualifies to the day he retires from active work, after which a pension should keep him till his death. The size of the salary cannot help being a question of heated debate; but, speaking of it on principle, I should say that it should be just sufficient to attract good and able men into the service and to make men content to work in it and anxious for their sons to follow them in it, and that no more than that should be asked of them.

Such a scheme as this presupposes also a geographical survey of the whole area to be administered and the placing of surgeries, clinics and hospitals at those places where they can best serve public needs. In practice, of course, we should have to depend on the existing buildings for all larger hospitals at any rate. The establishment, however, of surgeries and clinics and cottage hospitals wherever they are required should, on the basis of our existing service, present no insuperable difficulties. They would, of course, be established and equipped by the service. Doctors' own homes and living quarters would not be the responsibility of the service; but medical equipment would necessarily have to be. The plan to be envisaged is the provision in city and country of districts consisting of a central hospital, the headquarters, surrounded by smaller clinics, and these again by individual surgeries where needed. To what extent the work would be centralized under this scheme it is difficult to say. One feels that the proper place for the practice of any specialty is in the centres of population, where the clinical material is concentrated, and with modern ease of transport there should be no difficulty in making this provision in a planned service. On the other hand, with the whole service on a salary and the economic force of time and distance lessened or removed, it would be much easier for the more highly placed specialists to travel to country centres and for junior specialists to maintain touch with the cities. It may be, therefore, that it will be found that decentralization would be practicable under a planned service in a way that is not possible now.

The relation of doctor and patient must tend to alter to some extent when payment of fees from one to the other ceases; but I hardly think this alteration is going to be so great as may appear at first sight. Such a large proportion of our work is even now done without direct payment—through hospitals and lodges, and latterly through the insurance companies—that the change-over may well be less drastic than would be thought. The most probable change, I fear, is a change in the attitude of the doctor rather than in that of the patient—a lessening of his sense of responsibility to his patient for success or failure, with the lightening of the financial urge to shine at his work. I do not think this tendency will be serious, provided the same type of man enters the service and the same tradition prevails in it. I have seen enough of the work of medical officers in the army to know that among good men professional pride in good work will outweigh the loss of the financial incentive. But the possibility of it makes it essential for us to see that the service maintains the standards of the profession and that it attracts the right type of man. Apart from this aspect, there must be in a planned service a great increase of preventive public health work. I cannot see at the moment whether this will evolve a special body of public health men or whether the general practitioner will take over a much larger scope in this way. I think the result will be a combination of the two.

I do not propose to say anything about the position of the hospitals service and the nursing profession in relation to this scheme, except that it is obvious that even if provision for close liaison between the three services is not made at the outset, it will inevitably have to be developed later on. I can leave it at that.

Nor have I said anything about the cost of the scheme. One assumes that the immediate capital cost of the transfer would be financed by loan and the yearly expenditure by taxation; and I do not see why it should cost the public much, if any, more than they pay out now for medical services. Though the cost must interest everyone planning such a scheme, I do not think it need intrinsically concern us as a profession. Our concern is to elaborate out of our expert knowledge of conditions and needs a scheme of medical service for the nation which, we are satisfied, will be as nearly complete as it can be, and which will work effectively for the nation's health. Our duty when we have done that is to stand firmly by the scheme, considering only such suggestions for altering it as will make for its better effectiveness and refusing absolutely to compromise on any point vital to its efficiency by reason of expense or any other lesser grounds. In this position we shall be strong, and our position will be unassailable in that our only object will be the provision for the nation of a sound health service and for our successors in the medical profession an honourable future.

THE BEHAVIOUR OF THE BLOOD PLATELETS IN THYREOTOXICOSIS.

PHILIP WOODRUFF, M.D. (Melbourne),
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INTRODUCTORY.

THE association of thrombocytopenic purpura with toxic goitre is so rare that the occurrence of the following case prompted an investigation of the blood in thyreotoxicosis. The post-operative changes in the number of platelets in this case were of such interest that it was resolved to investigate these changes also in a series of thyreotoxic patients.

Report of a Case.

W.McL., a male patient, aged thirty-seven years, a bootmaker, was referred by his medical attendant to the Royal Melbourne Hospital, where he was first seen on August 13, 1938. He stated that he was a married man with two children, one of whom was mentally deficient. His father had died of Bright's disease and his mother of cancer. As far as he knew, none of his relatives suffered from goitre or any hæmorrhagic disease. He consulted his doctor because during the past eight months he had noticed reddish-purple spots on his arms and had suffered several severe epistaxes. His only previous illness was a "nervous breakdown" two and a half years earlier. After that he became "nervy and jumpy", with tremor of the arms and legs, and became hot and perspired very easily, but was able to carry on his work. His appetite was very good and he had lost half a stone in weight in the past six months.

Eight months earlier he noticed that he was bruising very easily, and reddish spots developed on his arms and legs and about his lips. Epistaxis lasting one to two hours was often produced by blowing his nose. He consulted his doctor, who observed that he had exophthalmos; the patient thought that this began at the same time as the bleeding from the nose.

He presented a flushed appearance, with pronounced exophthalmos and tremor, and was perspiring freely while at rest in bed. His temperature was 97·6° F., his pulse rate 120 beats per minute, and his respiration rate 22 per minute. The pulse was regular and forceful; the systolic blood pressure was 120 millimetres of mercury and the diastolic pressure 70 millimetres of mercury.

The heart and lungs were normal on physical examination. The spleen was just palpable. The nervous system presented evidences of increased or accelerated activity—in the increased activity of the vasodilator mechanism, shown by the patient's flushed appearance and perspiration, and in the sensorimotor mechanism, shown by increased activity of the reflexes. There was no sign of gross disease of the nervous system. Enlarged soft lymph glands were palpated in axillæ, groins and neck. There was diffuse enlargement of the thyreoid gland of moderate degree. There were numerous small purpuric spots, one to two millimetres in diameter, in the skin of the chest, the upper part of the abdomen and the limbs.

Radiological examination of the lungs and an electrocardiographic examination revealed no abnormality.

There was no reaction to the Wassermann, Van den Bergh and Fouchet tests. The urea content of the blood was estimated at 40 milligrammes per hundred cubic centimetres.

Estimations of the amount of vitamin *C* excreted in a twenty-four hours' specimen of urine on three separate occasions gave the following results: August 19, 1938, 22·3 units; August 22, 1938, 26·7 units; August 26, 1938, 44·6

units. After the first estimation the patient was given every day two tablets of "Redoxon" (ascorbic acid) till after the third estimation.

Examination of the blood gave the following information: the hæmoglobin value (Sahli) was 12·8 grammes per hundred cubic centimetres (91% on the 14-gramme scale); the red cells numbered 4,120,000 and the white cells 10,800 per cubic millimetre; the platelets numbered 73,000 per cubic millimetre. Occasional reticulocytes (less than 1%) were present. A differential leucocyte count yielded the following results: polymorphonuclear cells, 67%; eosinophile cells, 0·5%; basophile cells, 0·5%; old metamyelocytes, 9·5%; monocytes, 4·5%; lymphocytes, 17%; Turck cells, 1%. The bleeding time (Duke[5]) exceeded eighteen minutes (normal, two to five minutes); the coagulation time (Lee and White,[10] venous method) was eight minutes thirty seconds (normal, six to seven minutes). There was very little retraction of the clot at the end of forty-eight hours.

The basal metabolic rate was +140%; the patient was perfectly calm and quiet during the test.

Lugol's solution, fifteen minims three times a day, was given from the fifth day in hospital until operation.

A fortnight after his admission to hospital his temperature rose to 100° F., and on the following day a fresh crop of purpuric spots appeared. Next day an incision two inches long was made on the left thigh down to the deep fascia, in order to estimate the extent of hæmorrhage that might be expected during and after surgical operation, and the ease with which it might be controlled. In spite of careful ligature of all bleeding points the wound continued to ooze blood for sixteen hours. The bleeding was then stopped by the application of firm pressure and by an injection of ten cubic centimetres of "Clauden".

Three days later the patient had two severe epistaxes, and it was noticed that the wound on his thigh had become infected. During the next few days a localized cellulitis developed in the region of the wound, and eight days after the incision (five days after infection was observed) the thrombocyte count had risen to 267,000 per cubic millimetre. The cellulitis subsided rapidly. Four small blood transfusions of 25 cubic centimetres each were given on the next four days, and on the fifth day (September 12, 1938), under basal narcosis with "Avertin" and combined nitrous oxide and oxygen and local anæsthesia, subtotal thyreoidectomy was performed by Dr. Henry Searby. It was noticed that during the operation there was a little more bleeding than usual. The day after operation the thrombocytes numbered 22,700 per cubic millimetre, and thereafter the number gradually rose to a maximum of 351,000 per cubic millimetre on the seventeenth day. His convalescence was uneventful and he was discharged from hospital on the twenty-second day; the thrombocytes numbered 273,000 per cubic millimetre, and the basal metabolic rate was + 49%.

The patient was seen in the out-patient department four weeks later. He felt very well and had had no purpura or bleeding, but the number of thrombocytes had fallen to 152,000 per cubic millimetre and the basal metabolic rate had risen to +69%. Three weeks later the thrombocytes numbered 90,000 per cubic millimetre, and the patient still felt well and had no purpura or hæmorrhage.

After another fortnight he was readmitted to the medical ward for investigation, and he said that two days previously he had noticed some fresh purpuric spots—the first since his operation. A blood examination gave the following information: the red cells numbered 5,300,000 and the white cells 9,200 per cubic millimetre; the bleeding time (Duke[5]) was two minutes; the coagulation time (Lee and White,[10] venous method) was six minutes; the clot retraction was normal. The basal metabolic rate when the patient was at rest in hospital was +27%.

In an attempt to stimulate thrombocytosis an intravenous injection of "Aolan" (ten cubic centimetres) and an intramuscular injection of turpentine (50 minims in 10% solution in olive oil) were given at the times and with the results shown in the section of Table I between brackets. It was later realized that the interval between these injections and the period of observation after them were both too short for the effects to be judged. The patient was discharged four days after his readmission to hospital, and since then he has remained well and has been constantly at work.

The thrombocytes on June 19, 1939, numbered 251,000 per cubic millimetre.

The patient was last seen on August 26, 1939. He was well and working. There was no tremor or tachycardia or purpura; the spleen was no longer palpable. Exophthalmos was still present, but the right eye had receded a little, leaving the condition asymmetrical. The basal metabolic rate was +6% and the thrombocytes numbered 270,000 per cubic millimetre; the red cells numbered 5,200,000 and the white cells 6,000 per cubic millimetre. A differential leucocyte count gave the following results: polymorphonuclear cells, 78%; lymphocytes, 19%; monocytes, 3%. This is substantially the same as the differential leucocyte count made when the patient was first seen.

Discussion.

The patient presented a hæmorrhagic tendency, thrombocytopenia and thyreotoxicosis, and the main problem was the nature of the relationship (if any) between these three features.

The greatly prolonged bleeding time and very slightly prolonged coagulation time, with non-retractile clot, strongly suggested that the hæmorrhagic tendency was closely related to the thrombocytopenia and was indeed a true thrombocytopenic purpura. Since this condition occurs in some cases of profound toxæmia, it was considered possible that in this case the thrombocytopenia was being produced by paralysis of platelet production through the activity of the thyreotoxic agent. At the same

TABLE I.

Treatment, Results of Blood Examinations and Basal Metabolic Rate Determinations of W.McL.

Date.	Time.	Treatment.	Platelets per Cubic Millimetre.	Erythrocytes per Cubic Millimetre.	Leucocytes per Cubic Millimetre.	Bleeding Time.	Coagulation Time.	Basal Metabolic Rate.
13/8/38			73,000	4,120,000	10,800	18 mins.	8 mins. 30 secs.	+149%
20/8/38		Lugol's solution 15 minims three times a day till operation.						+86%
30/8/38								+123%
7/9/38			267,000			3 mins. 40 secs.	6 mins. 25 secs.	
8/9/38								+159%
12/9/38		Operation — Subtotal thyreoidectomy.						
13/9/38			22,700				11 mins.	
16/9/38			102,000			3 mins. 50 secs.	6 mins. 15 secs.	
29/9/38			351,000			2 mins.	6 mins. 50 secs.	
3/10/38			273,000			3 mins.	5 mins. 20 secs.	+49%
31/10/38			152,000					
5/11/38								+69%
19/11/38			90,000			2 mins. 45 secs.	7 mins. 30 secs.	
4/12/38	12 noon	"Aolan", 10 cubic centimetres intravenously.	101,000	5,300,000	9,200	2 mins.	6 mins.	+27%
	6 p.m.		99,000	5,150,000	20,100			
5/12/38	12 noon		136,000	5,050,000	9,800			
6/12/38	9.30 a.m.		130,000	5,500,000	6,900			
	10.30 a.m.	Turpentine, 10%, in olive oil, 50 minims intramuscularly.						
	2.30 p.m.		181,000	5,950,000	10,800			
	6.30 p.m.		168,000	5,550,000	11,100			
7/12/38	10.30 a.m.		191,000	6,010,000	9,200			
19/6/39			251,000					
26/8/39			270,000	5,200,000	6,000			+6%

time it was felt that the conditions might be unrelated. It was considered unlikely that the purpura had played a part in causing the thyreotoxicosis. It was deemed that for the sake of the thyreotoxicosis alone the patient was in urgent need of thyreoidectomy, and that if the first hypothesis concerning the relation between the two conditions was correct, then the severity of the purpura was also likely to be reduced by this operation.

The relative thrombocytosis immediately following the incision and cellulitis of the leg was the normal reaction to tissue damage, as described in papers by Dawbarn, Earlam and Evans,[4] and by others mentioned later in this article.

The profound immediate post-operative fall in the number of platelets may have been due to the liberation of an excessive amount of the thyreotoxic agent at the time of operation. On the other hand, it may have been due to the reinforcement of damaged capillaries by masses of platelets (Tidy[20]). The rise to a normal level during the succeeding seventeen days represented the normal post-operative thrombocytosis. The gradual fall in the number of platelets during the next two months coincided with the rise in the basal metabolic rate, and therefore may have been due to a partial recurrence of thyreotoxicosis. The beginning of the final return of the platelet level to normal coincided with the efforts to produce thrombocytosis by the introduction of foreign protein and the production of tissue damage. These factors may have been responsible for the return to normal of the platelet level; but during this period the basal metabolic rate also returned to normal, and the gradual disappearance of the thyreotoxicosis may have been the factor which brought about or permitted the return of the platelet level to normal.

The fact that with the surgical curing of the thyreotoxicosis both the thrombocytopenia and the hæmorrhagic tendency disappeared suggested that the thyreotoxic agent had been an important factor in causing the thrombocytopenic purpura. It was therefore resolved to attempt to determine whether the features of thrombocytopenic purpura were commonly manifested in a mild (subclinical) degree by patients suffering from thyreotoxicosis.

Profound thrombocytopenia is associated with hæmorrhage, prolonged bleeding time, normal coagulation time and non-retractile clot, to make up the syndrome of thrombocytopenic purpura. The critical platelet level below which hæmorrhages are likely to occur is variously estimated at 60,000 to 100,000 platelets per cubic millimetre; and there is a considerable gap between these figures and the generally accepted normal platelet level of 250,000 to 500,000. If, therefore, the hypothesis were correct that in the case under consideration the thrombocytopenia was due to poisoning of the platelet-producing tissue by the thyreotoxic agent, it was possible that the platelet level in a series of cases of thyreotoxicosis would lie between the critical level of 100,000 and the normal level of 250,000, and that, according to the severity of the toxic action and the susceptibility of the platelet-producing mechanism, in some cases the number of platelets might be even lower.

Historical.

The blood picture in thyreotoxicosis was described by Kocher[12] in 1908. He stated that the red cells were normal in size and shape, and normal or slightly increased in number; that there was a characteristic leucopenia with hypopolynucleosis, lymphocytosis and monocytosis. The lowest number of white cells in his cases was 2,000 per cubic millimetre.

Blank,[2] in 1920, emphasized the regular occurrence of a mononucleosis and the irregularity of the other changes. The hæmoglobin values were normal in only a quarter of his cases, the others being fairly evenly distributed above and below normal. Basophilic stippling of red cells was present in 75% of cases and the number of platelets was below normal in 43%.

Meulengracht,[17] in 1929, reported eight cases of pernicious anæmia, mostly severe, occurring in patients with thyreotoxicosis. These cases occurred in a total of 151 cases of pernicious anæmia.

Hertz and Lerman,[13] in 1932, examined by Sabin's supravital staining method the blood of 30 untreated patients suffering from toxic goitre. They found leucopenia, hypopolynucleosis, slight relative lymphocytosis and pronounced relative and absolute monocytosis to be quite characteristic of the disease. Iodine treatment caused a decrease in the total number of white cells; this was made up of a slight decrease in the lymphocytes and a pronounced decrease in the monocytes. The elevated number of monocytes and its depression by iodine were regarded in the light of Aschoff's theory of the origin of the monocyte, as evidence for the activation of the reticulo-endothelial system in thyreotoxicosis and for its depression during the remission produced by iodine. In eighteen cases in which observations were made, thyreoidectomy produced very little permanent change in the blood.

Gottlieb,[11] in 1934, found that the numbers of red cells and platelets were not strikingly diminished, but that low normal or slightly subnormal values were usual. He confirmed Kocher's findings with regard to the white cells, and pointed out that there was usually a pronounced "shift to the right" in the polymorphonuclear series. As this is seen in few conditions, Gottlieb considered it a point of some diagnostic value. In counts made in eleven cases during operation he demonstrated that in blood from the thyreoid vein the lymphocytes comprised 50% of the white cells, while in that from the thyreoid artery they comprised only 44%. There was no such variation in any other type of cell. In six cases of toxic goitre the numbers of platelets were all below the generally accepted normal value, the highest being 236,000 per cubic millimetre, the lowest 185,000 per cubic millimetre, and the mean 213,000.

Zondek and Kaatz,[30] in 1936, showed that small doses of thyreoidin by mouth caused a slight erythrocytosis and a more pronounced thrombocytosis. The effect of thyreotropic hormone was shown to be similar, but later and more prolonged.

Crotti,[3] in 1938, confirmed Kocher's original findings, though he was unable to find a total number of white cells as low as Kocher's. He stated that "the behaviour of the platelets in thyrotoxicosis is a chapter which has not been much investigated".

There has, however, been considerable work on changes in the number of platelets following various operations, including thyreoidectomy.

Rosenbaum,[19] in 1924, using Fonio's[9] method of counting, found in all his eight cases a thrombocytopenia following thyreoidectomy, in one of them following a previous thrombocytosis (988,000 to 484,000 per cubic millimetre).

Hueck,[10] in 1925, also used Fonio's[9] method, and observed five patients with thyreotoxicosis daily for fourteen days after operation. There was a transient fall in the number of platelets, followed by a sharp rise at about the seventh day to two or three times the original value. After the tenth to the thirteenth day the number fell again to normal.

Allen,[1] in 1927, after various surgical procedures (no goitre operations) found the following changes: the red cells generally fell post-operatively by as much as 1,000,000 and the number gradually rose to normal by the tenth day. With regard to the platelets Allen wrote:

> There were no uniform variations in the number of platelets . . . the number of platelets was approximately normal, varying from 200,000 to 260,000.

Normann,[18] in 1928, examined 60 patients for periods from one to three weeks after operation, at first using Kristenson's platelet-counting method requiring puncture of a vein, but later making direct counts from capillary blood, obtained by pricking the finger. He found a maximum difference of 10,000 between the numbers obtained by counts made from the same person by the two methods. His cases included various surgical conditions, and he found that the numbers of platelets formed a definite curve with a gradual rise and a steady fall. The anæsthetic and hæmorrhage had no demonstrable influence on the platelet changes. There was no relation between the

height of the rise in platelets and the occurrence of post-operative thrombosis; but whenever thrombosis occurred the platelet value either remained stationary or dropped. Normann regards these abnormalities of post-operative platelet values as of diagnostic importance for thrombosis.

Dawbarn, Earlam and Evans,[6] in 1928, investigating the relation of post-operative changes in the number of platelets to thrombosis, found a post-operative thrombocytosis beginning about the sixth day and reaching a maximum about the tenth day, the number returning to normal in about three weeks. The period of rise in the number of platelets corresponded with the observed time of occurrence of thrombosis and embolism. The degree of rise appeared to be related to the "severity" of the operation, but varied widely in the same type of operation. Dawbarn, Earlam and Evans found that sepsis was not a necessary factor in the production of post-operative thrombocytosis, and that hæmorrhage had no influence on the platelet level. Their series contained three patients with "parenchymatous goitre" who underwent hemithyreoidectomy; before operation the numbers of platelets were respectively 264,000, 201,000 and 318,000 per cubic millimetre, and their post-operative platelet curves differed in no way from those of patients submitted to a variety of other surgical procedures. These authors consider that the extent of the post-operative thrombocytosis depends on the amount of tissue damage occurring at operation.

Foged,[9] in 1930, made 155 platelet counts in 24 operation cases (various procedures). In 18 cases the numbers fell slightly on the first day, and there was a universal rise up to a maximum of 220% of the pre-operative figure, occurring about the fourteenth day.

Willinski,[22] in 1930, obtained generally similar results; but in a few of his cases there was a fairly pronounced fall with gradual return to normal and no rise. There were no cases of goitre in his series.

Windfeld,[23] in 1932, in an exhaustive examination of post-operative blood changes, studied cell volume, number of platelets, blood sedimentation rate, blood coagulation time, serum protein content and viscosity. After carefully checking the accuracy of his methods and demonstrating that rest in bed made no appreciable difference to the numbers of the various blood elements, he showed that after operations and fractures there was usually a thrombocytosis, beginning on the fourth or fifth day, reaching a maximum between the tenth and fifteenth days, then falling slowly and evenly without reaching a subnormal level. In a quarter of his cases there was a transient post-operative fall in the thrombocyte level for two or three days before the subsequent rise. There seemed to be no relation between the size of the operation and the degree of change in the number of platelets, except that very extensive operations were sometimes not followed by thrombocytosis. Evidence was presented that the stimulus to increase in the number of platelets was absorption of extravasated blood and of tissue breakdown products. The morphology of the platelets was well preserved; there was no increase in the number of small or giant forms. In Windfeld's series there were eight cases of toxic and five of colloid goitre. The lowest pre-operative platelet level was 350,000. All patients showed post-operative thrombocytosis; and in six of the cases of toxic goitre and in all cases of colloid goitre there was an immediate transient post-operative fall in the platelet level. The occurrence of this slight fall in 11 out of 13 cases of thyreoid disorder is noteworthy in a series in which such a change occurred in only 25% of the total cases.

Present Investigation.

The present investigation is concerned mainly with the platelet level in thyreotoxicosis and with post-operative changes in the platelet level in this condition, and consists of a comparison of red cell, white cell and platelet levels, and hæmoglobin estimations, from 20 patients with thyreotoxicosis and from 14 normal individuals. In the thyreotoxic group are nine males and 11 females, of an average age of 39·2 years (standard deviation, 11·3). The normal group comprises seven males and seven females, of an average age of 34·6 years (standard deviation, 12·6). There are noticeable differences between the age and sex distributions of the two groups, and these differences may possibly be thought to explain any differences in numbers of various blood elements in the two groups; but it can be shown that the difference in sex distribution is too small for any variation due to it to be detected in a group of this size. The age differences between the groups can be shown to be insignificant compared with the variations within each group.

In seven of the cases of thyreotoxicosis series of counts were made following thyreoidectomy for periods varying between six and seventeen days. Blood examinations were made within the first two days of each patient's stay in hospital, and in the majority of cases one or more further counts were made before operation. Selection of patients for a series of post-operative counts was made entirely on the basis of the amount of time available, and this selection depended in no way on the clinical condition or on the platelet level of the individual patients. Counts were made at varying times after operation; but in the last three cases the first post-operative counts were made two hours after the commencement of the operation, and further counts were made every one or two days till the patient left hospital. Differential leucocyte counts were made in five cases.

Technique.

Red and white cells were counted by the standard technique; the same red cell diluting pipette was used throughout and two white cell pipettes were used, one replacing a breakage; the same counting chamber was used. A modification of Fonio's[10] indirect method was used in counting platelets. This method was chosen for its simplicity and because each count necessitated only a finger-prick, not puncture of a vein. The smaller the procedure, the better for patients with thyreotoxicosis, especially just before and after operation.

The method used was as follows:

The dorsum of the thumb, just proximal to the nail, was cleansed with ether; a drop of a 3·8% solution of sodium citrate was placed on the skin and a puncture was made with a sharp needle through the drop of citrate solution. From the resulting drop of citrated blood three films were made. The citrate effectively prevented cohesion and clumping of platelets and caused these elements to be evenly distributed over the film. The films were fixed and stained with Leishman's stain and the ratio of the number of platelets to the number of red cells was determined on each film by counting the number of platelets in the area occupied by one thousand red cells. From these values and from the number of red cells the number of platelets per cubic millimetre of blood was determined.

Some authors consider that indirect methods of counting platelets involving a determination of the ratio of red cells to platelets, is less reliable and valuable than direct counting methods, such as those of Teoumine and Thomson, described by Tocantins[20] (1937). Harvey,[12] in 1937, considered that any of the recognized methods would prove reliable if used constantly by the same worker. Using Fonio's method, he found the normal ratio of platelets to red cells to be 4·8%. This gives a rather low average platelet level and is only 70% of the average figure for normal individuals in this series.

In order to determine the constancy of the counting method the following investigation was undertaken on each of two normal persons. Four skin punctures were made through four separate drops of sodium citrate solution at the same time, and three films were made from each of the four drops of citrated blood. A red cell count was made and the ratio of platelets to red cells was determined on each of the twelve slides. The results are shown in Table II.

It can be shown by the "Z" test described by Fisher[7] that there is no statistically significant difference in each case, either between the results from the four separate drops or between individual films from the same drop. In the light of these results it was determined that a sufficiently accurate count from any individual would be obtained by making three films from a single drop of citrated blood and determining the ratio of red cells to

TABLE II.

Drop.	Slide A.		Slide B.		Slide C.	
	Platelets.	Platelet Percentage of Erythrocytes.	Platelets.	Platelet Percentage of Erythrocytes.	Platelets.	Platelet Percentage of Erythrocytes.
Female patient, twenty-four years, Erythrocytes 5,600,000 per cubic millimetre.						
1	413,000	7·2	371,000	7·0	366,000	6·9
2	392,000	7·4	355,000	6·7	371,000	7·0
3	376,000	7·1	366,000	6·9	392,000	7·4
4	350,000	6·6	429,000	8·1	418,000	7·9
Male patient, twenty-eight years, Erythrocytes 5,600,000 per cubic millimetre.						
1	403,000	7·2	398,000	7·1	375,000	6·7
2	392,000	7·0	392,000	7·0	370,000	6·6
3	342,000	6·1	370,000	6·6	375,000	6·7
4	381,000	6·8	431,000	7·7	381,000	6·8

platelets for 1,000 red cells on each film. Accordingly this procedure was followed in all cases except three, in which clumping of platelets occurred on one of the three films, and in consequence only two films were counted. It is necessary to state that the three films did not in every case correspond so closely as those of the two normal individuals seen in Table II.

The effect of variations of certain extraneous factors on the counts was considered. The influence of differences in time relation to food and time of day was minimized by making all the counts between 3 p.m. and 4 p.m. (except for a few post-operative counts made on Saturday mornings). Variations during the menstrual cycle are not great (Genell[130]) and the time of the initial platelet count bore an entirely random relation to the stage of the menstrual cycle.

Results.

The Blood in Thyreotoxicosis.

Tables III and IV show the following: the results of initial counts of red cells, white cells and platelets of persons suffering from goitre and of normal persons, hæmoglobin estimations, ratio of platelets to red cells, and in five cases the results of differential leucocyte counts. A comparison of the values recorded for each blood element in cases of thyreotoxicosis with the values recorded for normal persons gives the following information.

Red Cells: The number of red cells was slightly lower in cases of thyreotoxicosis and showed a larger variance; but the difference was too small to be of statistical significance in this series. The mean figure for each group was well within generally accepted normal limits.

White Cells: The number of white cells in cases of thyreotoxicosis fell below those in the normal series, although both mean figures fell within normal limits. The difference between the two groups was sufficient to be of statistical significance in a series of this size. There was greater variance among the cases of thyreotoxicosis. The five cases in which differential leucocyte cell counts were made confirmed in general the findings of Kocher, Hertz and Lerman, and of Gottlieb—namely, hypopolynucleosis, lymphocytosis and monocytosis.

Hæmoglobin Value: The percentage of hæmoglobin was slightly lower in the group suffering from thyreotoxicosis and the variance was greater; but the difference was not sufficient to be statistically significant in a series of this size.

Platelets: The mean figure for platelets in the group suffering from thyreotoxicosis was considerably lower than that for the normal group, though both fell within generally accepted normal limits. The difference was "highly significant" statistically in a group of this size, and there was considerably greater variance among the cases of thyreotoxicosis.

Post-Operative Changes.

Changes observed in the number of red cells after operation were variable. In three cases there was an immediate post-operative rise, with gradual return to normal. In one case the figure rose and remained high throughout the period of observation (17 days); in two there was a post-operative fall, with a gradual return to normal; and in one there was an immediate post-operative fall, then a sharp rise, followed by a gradual return to normal (see Figure I).

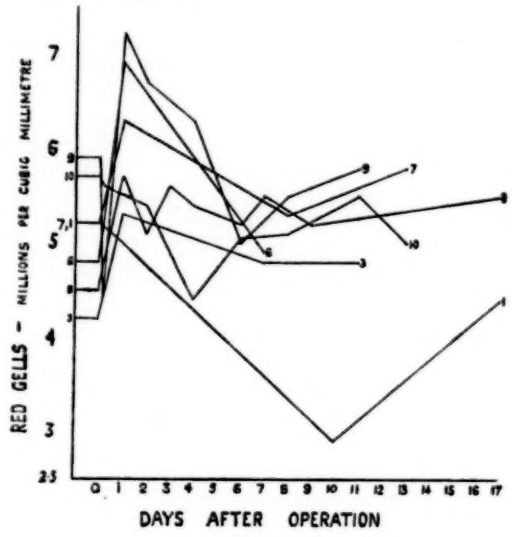

FIGURE I.

Graph showing the changes in the numbers of red cells after thyreoidectomy in the seven cases in which such observations were made. The small figures at the ends of each curve relate the graphs to the values shown in Table III.

The number of white cells showed a constant immediate post-operative rise, followed by a return to normal, at first sharp, then more gradual (see Figure II).

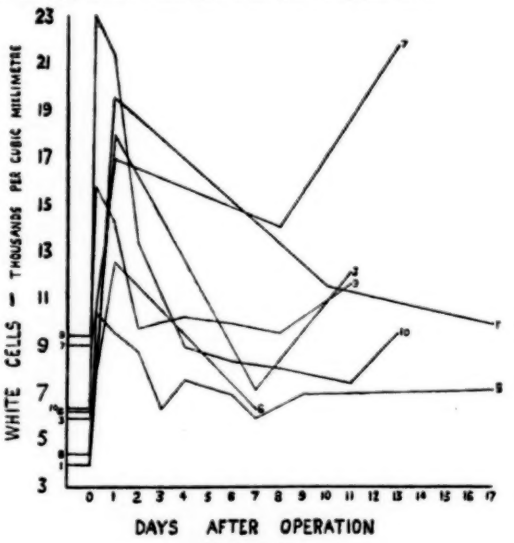

FIGURE II.

Graph showing the changes in the number of leucocytes after thyreoidectomy in seven cases.

Changes in the number of platelets were similar to those found by the following: Hueck;[114] Normann;[115] Dawbarn, Earlam and Evans;[40] Foged;[39] Willinski;[120] and Windfeld.[121] In some cases there was an immediate slight post-operative fall, followed by a universal rise, reaching

TABLE III.

The Blood Findings on Admission to Hospital in Twenty Cases of Thyreotoxicosis, Excluding the Case of W.McL., reported in this Paper.

Date.	Number of Subject.	Sex.	Age. (Years.)	Erythrocytes per Cubic Millimetre.	Leucocytes per Cubic Millimetre.	Polymorphonuclear Cells.	Lymphocytes.	Monocytes.	Hæmoglobin Value.	Platelets per Cubic Millimetre.	Platelet Percentage of Red Cells.
17/4/39	I	F.	25	4,050,000	6,100				80% = 11·2 gm.	249,000 196,000	6·1 4·8
24/4/39	II	M.	38	5,600,000	5,100				94% = 13·2 gm.	215,000 222,000 (268,000	3·8 4·0 4·8)
26/4/39	III	M.	57	4,200,000	5,900				87% = 12·2 gm.	210,000 235,000 285,000	5·0 5·6 6·8
28/4/39	IV	F.	31	4,100,000	4,400				56% = 7·9 gm.	221,000 205,000 221,000	5·4 5·0 5·4
5/5/39	V	M.	31	4,300,000	6,500				77% = 10·8 gm.	142,000 142,000 163,000	3·3 3·3 3·8
8/5/39	VI	M.	28	5,300,000	8,300				91% = 12·8 gm.	307,000 277,000 254,000	5·8 5·2 4·8
12/5/39	VII	M.	33	5,200,000	9,000				87% = 12·2 gm.	296,000 260,000	5·7 5·0
20/6/39	VIII	F.	51	4,900,000	8,500	61·5%	30%	8·5%	94% = 13·2 gm.	142,000 152,000 103,000	2·9 3·1 2·1
21/6/39	IX	M.	49	5,900,000	9,400				102% = 14·3 gm.	201,000 236,000 231,000	3·4 4·0 3·9
12/7/39	X	F.	18	5,900,000	10,800				92% = 12·9 gm.	561,000 537,000 696,000	9·5 9·1 11·8
25/7/39	XI	F.	44	5,500,000	5,300				90% = 12·6 gm.	193,000 176,000 182,000	3·5 3·2 3·3
27/7/39	XII	F.	47	5,300,000	4,500				93% = 13·0 gm.	297,000 254,000 259,000	5·6 4·8 4·9
31/7/39	XIII	F.	44	4,500,000	9,400				72% = 10·2 gm.	414,000 526,000 409,000	9·2 11·7 9·1
2/8/39	XIV	F.	39	5,800,000	6,100				85% = 12·0 gm.	441,000 429,000 458,000	7·6 7·4 7·9
8/8/39	XV	F.	25	5,500,000	5,800	72%	24%	4%	87% = 12·2 gm.	286,000 209,000 242,000	5·2 3·8 4·4
14/8/39	XVI	M.	39	5,900,000	4,400	38%	50%	12%	101% = 14·2 gm.	313,000 319,000 366,000	5·3 5·4 6·2
16/8/39	XVII	F.	41	5,300,000	6,700				85% = 12·0 gm.	297,000 249,000 329,000	5·6 4·7 6·2
4/9/39	XVIII	M.	56	4,100,000	5,600				88% = 12·4 gm.	291,000 258,000	7·1 6·3
6/9/39	XIX	F.	56	5,600,000	4,100	64%	31%	5%	99% = 13·9 gm.	263,000 257,000 241,000	4·7 4·6 4·3
13/9/39	XX	M.	32	5,000,000	8,800	54%	39%	7%	100% = 14·0 gm.	320,000 300,000 305,000	6·4 6·0 6·1
Mean			39·2	5,100,000	6,730				88%	281,000	4·89
Standard deviation			11·3	6·6 (51)	20·1 (67·3)				10·9	113 (281)	2·13

a maximum in one case as early as the fourth day, and in another not before the seventeenth day. This rise was followed by a gradual return to normal. Rosenbaum[18] in his series found a post-operative thrombocytopenia, and Allen[1] found no definite change in the number of platelets. In the records of the writers quoted there is no apparent difference between platelet changes following thyreoidectomy and those following other operations. The only feature in which the present series differs from the majority of those reported previously for various surgical procedures is the greater irregularity of the time required for the maximum platelet value to be reached (see Figure III).

Figure III shows the changes in the number of platelets after thyreoidectomy in the seven cases in which such observations were made.

The post-operative course of subject number IX is of some special interest.

J.H., a male patient, aged forty-nine years, had suffered from mild thyreotoxicosis for four years. He had pronounced exophthalmos and a small goitre. Before operation the number of platelets was 223,000 per cubic millimetre. After operation there was a transient fall in the number of platelets for one day, followed by a sharp rise to 1,150,000 per cubic millimetre on the fourth day. This was followed by an equally sudden fall to 389,000 per

TABLE IV.

The Blood Findings of Fourteen Normal Persons.

Date.	Number of Subject.	Sex.	Age.	Erythrocytes per Cubic Millimetre.	Leucocytes per Cubic Millimetre.	Hæmoglobin Value.	Platelets per Cubic Millimetre.	Platelet Percentage of Red Cells.
12/4/39	XXI	M.	26	5,600,000			460,000 361,000 275,000	8·2 6·5 4·9
12/4/39	XXII	M.	26	5,100,000			276,000 252,000 364,000	5·4 5·0 7·1
26/4/39	XXIII	F.	54	5,800,000	11,100	86% = 12·1 gm.	319,000 331,000 342,000	5·5 5·7 5·9
1/8/39	XXIV	M.	35	6,000,000	7,400	101% = 14·2 gm.	630,000 540,000 534,000	10·5 9·0 8·9
3/8/39	XXV	F.	32	4,200,000	6,300	79% = 11·1 gm.	273,000 462,000 281,000	6·5 11·0 6·7
8/8/39	XXVI	F.	24	5,300,000	8,900	86% = 12·1 gm.	350,000 429,000 418,000	6·6 8·1 7·9
9/8/39	XXVII	F.	18	5,400,000	11,800		389,000 464,000	7·2 8·6
15/8/39	XXVIII	M.	27	5,700,000	7,200	96% = 13·4 gm.	407,000	7·1
21/8/39	XXIX	F.	18	4,600,000		84% = 11·8 gm.	345,000 285,000 294,000	7·5 6·2 6·4
23/8/39	XXX	M.	28	5,600,000			381,000 431,000 381,000	6·8 7·7 6·8
29/8/39	XXXI	F.	46	5,100,000	9,400	87% = 12·2 gm.	342,000 316,000 362,000	6·7 6·2 7·1
11/9/39	XXXII	M.	49	5,800,000	7,500	107% = 15·0 gm.	319,000 348,000 383,000	5·5 6·0 6·6
19/9/39	XXXIII	F.	44	5,400,000	6,900	98% = 13·8 gm.	308,000 329,000 313,000	5·7 6·1 5·8
21/9/39	XXXIV	M.	57	5,600,000	7,300	101% = 14·2 gm.	504,000 554,000 521,000	9·0 9·9 9·3
Mean Standard deviation			34·6 12·6	5,370,000 4·9 (53·7)	8,380 18·6 (83·8)	93·5% 9·3	381,000 89 (381)	6·86 1·51

cubic millimetre on the sixth day, and during the subsequent five days there was a further slight progressive fall. On the ninth day after operation the patient experienced a sharp pain in the right side of the chest, localized to an area beneath the sixth and seventh ribs in the mid-axillary line. He stated that the pain caught him when he took a breath, and that an area "about the size of a two-shilling piece felt rough". A transient friction rub was audible. There was no hæmoptysis, the symptoms lasted only two days, and the patient suffered no prolonged ill effect.

This event, apparently a minute pulmonary embolus, is interesting in view of the fact that the platelet level in this case rose very high in a very short time, and that the number of platelets subsequently fell suddenly.

CONCLUSIONS.

Although the mean values of all the blood elements examined for the two groups of subjects (normal and suffering from thyreotoxicosis) considered in this paper fell within generally accepted normal limits, there were certain significant differences between the two groups. The groups were similar with regard to age and sex, and all estimations were made by the same technique, with the same apparatus, by the same observer, and as nearly as possible at the same time of day.

In the group suffering from thyreotoxicosis the numbers of leucocytes and platelets were significantly lower—the difference being much more pronounced in the platelets—and in all the blood elements examined there was a greater variance in this group.

The failure to demonstrate any significant difference between the number of red cells and the hæmoglobin values for the two groups serves to emphasize the reality of the differences in the numbers of platelets and white cells, and to show that these differences are specific to their respective blood elements and not merely part of the general depression of bone marrow activity.

The greater variance observed throughout in the cases of thyreotoxicosis bears out in this condition the statement of Duke[6] that "in almost every disease in which the number of platelets is influenced by circulating toxins, the count may be either increased or reduced according to the intensity of these toxic actions on the bone marrow".

In the case reported at the beginning of this paper there is reason to think that the toxic action was sufficient to precipitate actual thrombocytopenic purpura, which disappeared within twelve months after thyreoidectomy, while in a case of thyreotoxicosis mentioned by Rosenbaum[10] the platelet level was 988,000 per cubic millimetre, and the effect of the toxin was apparently to stimulate increased platelet formation. It would appear that the effect of the thyreotoxicosis on the platelet-producing tissue affords a good illustration of the well-known pathological principle that while a mild toxic influence may produce stimulation of a given tissue, a more intense or prolonged action of a similar toxin is likely to produce some paralysis of function. The results here recorded suggest that in thyreotoxicosis the toxic action is usually sufficiently pronounced for the paralysing effect on platelet production to be manifest. Further

investigation may reveal a relation between the severity of the thyreotoxicosis and the effect on the platelet level.

SUMMARY.

1. A case of thrombocytopenic purpura occurring in a patient suffering from toxic goitre is reported, both conditions being cured by thyreoidectomy.

2. Earlier work on the blood in thyreotoxicosis and on changes in the number of platelets after operation is summarized.

3. (*a*) Results of blood examinations in twenty cases of thyreotoxicosis are shown, and these are compared with the blood findings in fourteen normal individuals. (*b*) Blood changes after thyreoidectomy in seven cases are stated and discussed.

4. The toxic action of this disease on the platelet-producing tissue is discussed.

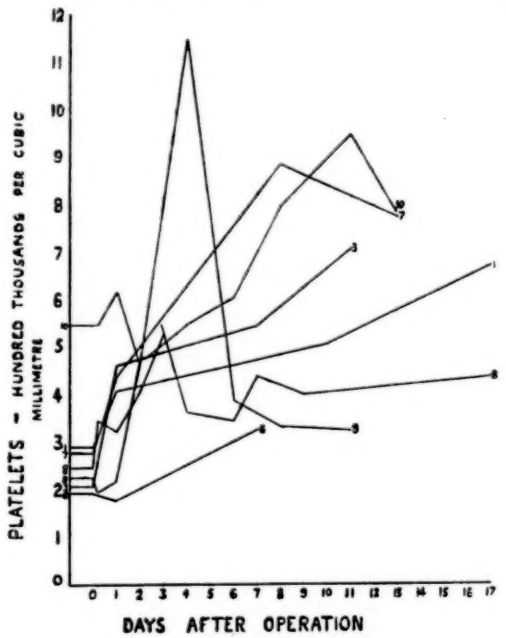

FIGURE III.
Graph showing the changes in the number of platelets after thyreoidectomy in seven cases.

ACKNOWLEDGEMENTS.

My thanks are due to Dr. S. V. Sewell for suggesting that this subject might be investigated; to Dr. Charles Kellaway for allowing me to work in the Walter and Eliza Hall Institute; to the members of the honorary staff of the Royal Melbourne Hospital for permission to examine and report on patients under their care; to the University of Melbourne as trustee of the Randall and Louisa Alcock Research Scholarship Fund; to Dr. Hilda Gardner for most of the blood examinations in the first case reported, and for invaluable and constant help; to Miss V. Splatt for determinations of basal metabolic rates; and to Professor P. MacCallum for helpful criticism, particularly with regard to the presentation of the facts here set out.

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Reviews.

A YEAR BOOK OF MEDICINE.

FROM the firm of Butterworth and Company comes an interesting annual volume in a form that will be new to many medical practitioners. The title, "The British Encyclopædia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynæcology and Other Special Subjects: Surveys and Abstracts, 1939"[1] gives an idea of its scope. This volume is designed primarily as part of a supplementary system of the twelve-volume "British Encyclopædia of Medical Practice". The twelve-volume encyclopædia also has a small annual cumulative supplement so arranged that it will keep the larger work up to date. The present volume of "Surveys and Abstracts" thus becomes to all intents and purposes a year book—it is complete in itself and can be purchased apart from the larger system. The book is divided into three parts. The first part, "Critical Surveys", consists of a series of articles by acknowledged authorities and experts, "describing in general terms the present position and possible future developments in certain branches of medical science". The second part is quite short and comprises an outline of some recent advances in pharmaceutical knowledge and of its application to therapeutics. The third part is a collection of abstracts of medical literature.

[1] "The British Encyclopædia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynæcology and Other Special Subjects. Surveys and Abstracts, 1939", under the general editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D., D.Sc., D.C.L., LL.D.; Publishing Editor: A. Clark, L.M.S.S.A.; Sub-Editor: G. Faulkner, D.Sc.; 1940. London: Butterworth and Company (Publishers) Limited. Super royal 8vo, pp. 678, with illustrations. Price: 32s. 6d. net.

It will be convenient to make reference first to the second part of this book, that concerned with drugs. Only two chapters, eighteen pages in all, go to make this section. One chapter deals with "some modern drugs" and the other is an excellent discourse on the pharmacology of the sulphonamide drugs. The latter may be commended to the careful study of practitioners. The chapter on modern drugs deals with only a few selected therapeutic agents. Many substances that the reader would expect to find mentioned here are not included, but will be found on reference to the abstracts in the third part of the volume. The point is that neither the first nor second parts should be considered apart from the third. In fact the reader will have to learn how to use this book if he wishes to get the best out of it. For example, in the first part the treatment of gastric and duodenal ulcer is mentioned in an article by Sir Arthur Hurst; in the second part will be found reference to the value of aluminium hydroxide; and in the third will be found many useful abstracts on peptic ulcer. If the reader consults the third part first he will find references to pages in the other two.

The first part of the book starts with a critical survey of the State and national health, by Sir Arthur MacNalty, Chief Medical Officer of the Ministry of Health. In this masterly statement Sir Arthur MacNalty not only gives a vivid outline of the growth of State medicine, but he also shows that much remains to be done. Every year, he points out, research forges new weapons and places them in the clinician's hand for the fight against disease; each year the weapons are more keenly tempered and of greater potency. He lays emphasis on one aspect that has always been regarded in this journal as of the utmost importance, when he states that a great field of work lies open in the sociological side of medicine and that this is concerned with the removal of social conditions that promote ill health, retard a patient's recovery or favour relapse. It is appropriate that a reminder such as this should be given to readers before they pass on to the scientific surveys that follow. These articles are twenty-four in number and each is complete in itself. Obviously it is impossible to give a review of these contributions, nor is it necessary. Almost every important subject has been covered. Some subjects that might be deemed worthy of a separate article receive attention in the abstracts. For instance, there is no critical survey of aviation medicine or of the problems and physiological considerations associated with flying; but in the third part will be found several important abstracts on aviation. Little, if anything, appears to have been overlooked. Perhaps insufficient mention has been made of viruses in the causation of disease. Professor F. R. Fraser, in his survey of general medicine, mentions them briefly; we should have expected to see a special article devoted to them, but this may be a debatable point. As Sir Humphry Rolleston, the editor-in-chief, points out in the introduction, these articles will vary from year to year according to the circumstances of scientific and medical progress. Thus we see among the surveys in this volume one by F. M. Burnet and E. H. Derrick on "Q" fever; next year such an article will probably not be necessary.

The abstracts in the third part are arranged in alphabetical order according to subjects. If it were necessary to state which was the most valuable part of the book we should choose the third part. As far as we are able to judge, nothing of clinical interest has been omitted. The work of Australian investigators has not been overlooked, as is clear from the many references to THE MEDICAL JOURNAL OF AUSTRALIA.

This is a book that is certain to be of use to many readers. Its arrangement is unusual, but it is wonderfully complete. The printing is excellent and some of the illustrations are first rate. It would be difficult to improve on Plate IV, facing page 450. If the printers are to be complimented we feel that the publishing editors, Dr. Adam Clark and Dr. G. Faulkner, should not be forgotten, for they have done a fine piece of work. An improvement might be made in future years in the index by the inclusion of more cross references. At present the reader may waste time looking for things that should be found without difficulty; this can easily be rectified.

BIOLOGICAL CHEMISTRY.

THE general plan of Fearon's "Introduction to Biochemistry" has not been altered in the second edition, but much of the book has been rewritten and several new chapters have been added.[1] In text-books of biological chemistry attention is usually concentrated too exclusively on the organic constituents of the body and the changes which they undergo in the course of metabolism. It is often forgotten that living things have probably originated in an inorganic environment and that the more intimate drama of life is still played against an inorganic background. Fearon, however, approaches the subject through an unusually full discussion of the inorganic constituents of the body and a discussion of the importance of that wide range of elements which together make up nearly 5% of the body substance. The rest of the book deals with the three great groups of compounds which form the great bulk of the solid part of the body: carbohydrates, proteins and lipides. Although this part follows conventional lines, from which indeed it is difficult to depart, there is much that is original and stimulating in the manner of presentation. The intermediary metabolism of these groups is not dealt with until chapters on the pigments of the body, enzymes and digestion have been presented. The chapters on intermediary metabolism are followed by those on tissue respiration, excretion and the hormones.

Dr. Fearon has successfully included much very recent material in his book. Although the treatment is compressed to the point of being synoptic, it is no mere summary. The author has been able to preserve a philosophical point of view through it all. The clarity of presentation owes much to the numerous schematic presentations of important biochemical processes in the body. The final chapter on the "internal environment" is very brief, and by comparison with the rest of the book, disappointing. It consists of tables of quantitative data on the composition of various body fluids, almost without comment. In this chapter some philosophical treatment of the subject would seem to be particularly called for, especially after the manner in which the subject was introduced in the first chapter.

No mention is made of the biochemistry of respiration or of the respiratory function of the blood pigment. No doubt considerations of space have been responsible for the omission, for which no reason is given. There is a tendency among recent introductory text-books to evade this important chapter of biochemistry. The excuse usually given is that the subject is dealt with in text-books of physiology. It is an evasion to be deplored, as much of the process of respiration is purely chemical. It seems rather illogical to discuss some of the properties of hæmoglobin and to omit what is the most important of all from the point of view of bodily economy, namely, the part which it plays in the transport of oxygen and carbon dioxide.

Another aspect of biological chemistry which is not dealt with is energy metabolism. The omission of any discussion of this part of the subject is to be regretted in any text-book which introduces the student to the subject; the position is not the same as in more advanced and specialized works. After all, a considerable proportion of the reactions which occur in the body are intimately concerned with exchanges of energy. Details of intermediary chemical changes should not be discussed to the exclusion of the main changes which they subserve.

The inclusion of descriptions of a few methods of blood analysis and of a few biochemical reagents does not seem to serve any useful purpose in an introductory text-book. The twelve pages so occupied could be employed to better purpose.

The book contains many references carefully selected to include general articles and reviews through which the inquiring student can extend his reading to more specialized papers. This stimulating and up-to-date introduction to biological chemistry contains an astonishing amount of information within its limits. It can be highly recommended not only to the student, but also to any reader requiring ready access to information on the parts of the subject with which it deals.

[1] "An Introduction to Biochemistry", by W. R. Fearon, M.A., Sc.D., M.B., F.I.C.; Second Edition; 1940. London: William Heinemann (Medical Books) Limited. Demy 8vo, pp. 485, with illustrations. Price: 17s. 6d. net.

Notes on Books, Current Journals and New Appliances.

"THE COMPLEAT PEDIATRICIAN."

THE first and second editions of "The Compleat Pediatrician" have been reviewed in these pages; the third has now appeared.[1] This book, which we described as a "carefully indexed pædiatric 'omnibus'", still seems to us to be as peculiar as it was, and in spite of its peculiarity we still think that it contains an enormous amount of information. In this third edition ten thousand lines have been changed; we admire the author's industry.

[1] "The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics", by W. C. Davison, M.A., D.Sc., M.D.; Third Edition; 1940. Durham: Duke University Press. Royal 8vo, pp. 262. Price: $3.75 net.

The Medical Journal of Australia

SATURDAY, AUGUST 31, 1940.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE MEDICAL PROFESSION AND THE FUTURE.

THE paper by Dr. A. E. Brown published in this issue and the discussion that took place when it was read at a recent meeting of the Victorian Branch of the British Medical Association are of much more than passing interest; they are an indication of the grave concern that is felt by many persons for the future of medicine in this country and of the far-reaching measures that are sometimes deemed necessary if its advance is to be continued and its effectiveness remain unimpaired. That serious thought has been given to this subject is shown by such articles as the address delivered by Dr. W. P. Holman at the last annual meeting of the Tasmanian Branch of the British Medical Association and published in this journal on April 27, 1940, and the paper by Dr. Stanley Boyd, read at a meeting of the Western Australian Branch and published on April 13, 1940. On more than one occasion we have pointed to the continuous and inevitable evolution of society towards a state where its different strata will merge into one another instead of being separated by lines of demarcation, where neither heavy wealth nor cruel poverty will find a place, where opportunities of intellectual development will be for everyone to seize if they wish, where oppression and exploitation of the weak by the strong will not be possible, and where the right of every citizen to good health and to an active share in steps taken to gain it will be taken for granted. This evolution must obviously affect every aspect of social life; and thus it happens that, although medical practitioners are concerned with the health of the people, they cannot confine their attention to health matters if they wish to do their full duty by their fellow men. They must also fight against the crushing burden of poverty, the killing sloth engendered by mental torpor, and the insensate abuse and cruelty sometimes shown towards those who are too weak to look after themselves. There can surely be none among the body of Australian medical practitioners who are ignorant of the changes going on around them, and none who will think that they are not concerned with every one of these changes. In any society, however constituted, medicine can have but two objectives—the discovery of all that is to be known about disease and the application of that knowledge to the prevention and cure of disease in human beings. In other words, though the whole face of society change, the objectives of medicine will remain as they are. Changes there will be; but they will be changes of method, of ways and means. Medical research may be provided for in a new way, its control may pass into different hands, coordination more extensive than is yet envisaged may come into being; all these things may happen, and yet the object of research will still be the discovery of the cause of disease, of methods of prevention and of means of cure. Similarly, the complicated undertaking known as medical practice will change in the future, as it has changed in the past. It will change because of the difficulty now being met in the attainment of its objectives, chiefly by reason of the increasing cost of complete medical care, and also because of the altered constitution of the society in which it is conducted.

In a previous reference to this subject in February last we referred to a letter by Dr. Brown in which he urged that we should "see if we within our own ranks cannot devise some plan to meet future social needs". We pointed out that the needs of society had to be met, and remarked that, to say the least of it, it was more pleasant to plan with understanding than to be compelled to conform to the plan of someone else who had insufficient knowledge. In his recent Victorian Branch paper Dr. Brown has stated his case for the "reorganization" of the medical profession. From Dr. Dale's remarks it is clear that differences of opinion exist regarding the organization of the profession; but, be that as it may, Dr. Brown would have the whole profession marching in step in a complete service organized by the State, but "wisely and sympathetically governed by men steeped in the professional tradition of pride in ability and in service". Many people see in a State medical service the fully developed medical practice of the future—the end of the present evolutionary process; and it must be admitted that a service controlled in the way suggested by Dr. Brown would be preferable to one controlled by persons who knew nothing of tradition and cared not for pride in skill and ability. Others again believe that the generally recognized need can be met in ways that appear to them less drastic, less iconoclastic. Since those who see no need may and must be disregarded, what we may call the short-planners and the long-planners, like Dr. Brown, have one task in common—they have to try to devise a plan suited to the needs of the present and of the immediate future. In this regard we cannot do better than refer to Dr. Dale's statement when he described as "surely excellent" the fact that free men should associate and agree to organize their work to the common advantage—this might indeed be taken as the text of the present discussion. It is in this spirit that the present problem must be faced. The common advantage must be sought and it will be quite clear that if every group of persons that can make a contribution is seeking the common advantage, every group will be called upon to

make sacrifices if the advantage is to be attained. It is inconceivable that every contributing group will be able to give effect to its own pet ideas, its own convictions, without finding itself confronted with different and perhaps opposing ideas and convictions cherished with equal ardour by another group. A life of service may often be a life of sacrifice. When the practising medical profession has to take a share in the planning of a public medical activity, however small, it is better qualified than anyone else to show that the preservation of the tradition of medicine and the fostering of keenness and skill among its members are likely to secure the public benefit. It is for this reason that we have urged the medical profession to follow Dr. Brown's original suggestion and to formulate some plan of action. Further, when plans are discussed it is well to remember that attempts at planning too often end in a statement of generalities and an expression of hope, instead of in some concrete action.

The matter may be summarized and the conclusions stated shortly. The changes already upon us and looming in the distance have been mentioned and a plea has been made once more for the initiation of action that will meet present requirements and serve as a basis for what will be necessary in the future. This action, which is of the kind that we have called short-planning, should be in keeping with the traditions of medicine and should foster the keenness and ability of the profession. To do this will not commit the members of the profession to eventual participation in a national medical service. It will mean, however, that should complete national service in the fullness of time become either necessary or advisable, the profession will have shown that it is not unmindful of the public welfare, it will have gained some measure of respect from the public, and its views may be looked upon as worthy of attention.

Current Comment.

FUNCTIONAL RHYTHMS.

THE manifestations of seasonal periodicity have received far more attention in the domestic and laboratory animal than in the human being. The physiologist is aware that summer and winter frogs are divergent in their muscular and nervous responses. Sir Chalmers Mitchell has deplored the fact that imported Australian animals in the London Zoo keep faithful to their antipodean calendar with a persistence worthy of a better cause and meet the English winter with their thin summer coats and correspondingly are uncomfortable in the summer with their thick coats. The possibility of the human epidermis exhibiting similar seasonal rhythm has attracted but little attention, but that it is present is shown by the alarm many women feel concerning their hair falling out when they reverse the yearly seasons by travelling from southern hemisphere to northern and *vice versa*. A yearly periodicity in skin complaints is, of course, well known to dermatologists. That the growth of children is not uniform throughout the year, but has a peak in spring and early summer, has been demonstrated in many countries. Mention may also be made of the autumnal character of typhoid fever and the biannual incidence of measles. F. Chrometzka and G. Beutmann, of the medical clinic of Kiel,[1] have shown that there is a marked summer-winter rhythm in carbohydrate metabolism, and corresponding variations in action can be observed in those many drugs which alter the concentration of blood sugar. It is also highly possible that the effects of injected sex hormones also vary according to the time of year.

Much more obvious are the diurnal variations of the human body, and naturally we place sleep foremost in this category; but in this very same regard we find that so much attention has been paid to cortical sleep that the subcortical and extracerebral accompaniments are neglected. Why, for instance, should we find that the respiratory movements of the sleeping human male conform to the costal type of the female? One probable explanation is that the diaphragmatic massage of the digestive organs is contraindicated. We are familiar with the daily oscillation of body temperature, which has an amplitude of approximately one degree Centigrade, the excursus being increased in pyrexia; we have the morning defæcation and the morning and forenoon anuria despite the customary breakfast diuretic; we are also aware of the psychological rebound from the coldly logical morning outlook to the emotional evening one. Almost everyone has experienced the nightly exacerbation of pain arising from inflammation of bone, tooth or joint, also the morning "loosening" of phlegm in bronchitis. There are, however, other daily rhythms which require modern diagnostic methods for their detection. In 1935 Forsgren, of Stockholm,[2] proved conclusively that the liver by day is chiefly secretory and excretory, whereas its nightly activity is predominantly anabolic. Stimulated by this discovery, a number of investigators have subjected many body functions to a careful scrutiny, and sure enough diurnal periodicity has been observed. Many so-called blood constants in health, such as total volume and the concentration of sugar, urobilinogen, and hydrogen ions, and the number of red cells and neutrophile leucocytes have been shown by Werner Menzel to manifest a night and day rhythm.[3] One of the most recently investigated by H. Regelsberger and one displaying a particularly perfect diurnal curve is the electrical conductivity of the skin.[3] Just what factors are involved here have not been fully elucidated, but vascularity and also activity of the sweat glands, though remaining "insensible", play a prominent part.

Some forty years ago Benjamin Moore demonstrated that even protozoa can possess an endogenous diurnal capacity for varying day and night functional activities independent of the environment, though originally imposed by it. When *Noctiluca* was kept in darkness it showed periods of luminescence followed by periods of inhibition of luminescence which kept pace roughly with the nights and days outside the darkened experimental tank. Herbert Spencer made rhythm of motion one of his "first principles"; but in the problems of animal functioning it is unnecessary to resort to philosophical concepts when the earth's rotation and the inclination of its axis to the ecliptic impose upon all life on this planet the inescapable periodicity of day and year.

[1] *Klinische Wochenschrift*, March 2, 1940.

ULTRASONICS IN MEDICINE.

THE hopes that ultrasonics might find some valuable application in medical science have not as yet been fulfilled. Sound waves with frequencies beyond the limits of hearing of the ear and with wave lengths which may even approximate to the small dimensions of those of light can now be produced with an energy content capable of producing surprising changes in the medium through which they travel. It is probably in colloidal chemistry and physics that the most interesting and useful discoveries have been made. Earlier work in biology showed that protoplasm is destroyed, partly by bubble formation and partly by the development of hydrogen peroxide, nitric acid and nitrous acid in the aqueous substrate. Yeast cells and red blood corpuscles are cytolysed by probably the same agents. More

[1] *"Ueber die Rhythmik der Leberfunktion des Stoffwechsels und des Schlafes"*, 1935.
[2] *Klinische Wochenschrift*, January 13, 1940.
[3] *Klinische Wochenschrift*, January 6, 1940.

interesting are those destructive or disintegrating actions in which structure other than molecular is not apparent; thus starch is transformed into dextrins, and cane sugar to a limited extent to dextrose and lævulose, whilst pepsin, diastase, insulin, vitamin *C* and ergosterol are destroyed.

An inquiry into possible applications in medicine has been made by H. Gohr, of the chemical laboratory of the Köln University, and by Th. Wedekind, of the Köln Hospital,[1] and their results are not encouraging. It is true that the temperature of a tissue can be raised by ultrasonics, but, as these authors point out, there are simpler and less dangerous methods for attaining this effect. For similar reasons the use of ultrasonics as a disinfectant must be put aside. There remain three practical possibilities, which are put forward with commendable restraint. If suitable wave lengths are chosen, one can obtain ultrasonic shadows of internal organs which could be used to supplement the X-ray picture. As a method for preparing new therapeutic products, particularly dispersoids, ultrasonics might have a useful application. Thirdly, the very rapid and complete removal of dust from air is decidedly promising in both medical and surgical technique. A fourth possibility arising from work carried out by H. Loewenthal and H. L. Hopwood[2] is the disintegration of streptococci and other pathogenic organisms and the consequent liberation of antigens which can be used in the preparation of serum.

THE PECTEN BAND OF THE ANUS.

THE existence of the pecten band of the anus was first reported in 1919 by W. E. Miles, who described it as a circular band varying in thickness and density and giving an impression to the examining finger such as would be obtained if a rubber umbrella ring had been inserted beneath the skin at the anal margin. Miles named it the pecten band because it lay beneath the mucous membrane of that zone of the anal canal bounded below by the white line and above by the anal valves, and called the pecten because of its resemblance to a comb. If Miles's name for it is not altogether a happy one, because it is undescriptive, the existence and identity of the band have been amply confirmed, and its surgical division, which Miles called "pectenotomy", is often practised with favourable results, it is claimed, for the relief of anal pruritus and of certain kinds of dyschezia.

J. Fine and C. H. W. Lawes have recently thrown new light on the nature of the pecten band.[3] Miles concluded that it was composed of fibrous tissue and was a morbid structure; but he adduced no histological evidence to support this view, which has been shared by others and appears to be based on the whiteness of the fibres of the band, which makes it stand out in contrast with the red fibres of the contiguous external sphincter muscle. In 1934 J. W. Morgan reported finding unstriated muscle fibres in the pecten band in two specimens out of seven. Now Fine and Lawes have also made a histological study of the submucous layer of the anus in seven specimens obtained *post mortem*. They found that in every specimen examined a compact band of involuntary muscle fibres was present in the submucous layer close to, but distinct from, the internal sphincter muscle, and in three of the specimens was so well developed as to be visible to the naked eye. In this latter case, they state, it was easy to imagine that the structure might have been palpable during life as a pecten band. In four further specimens obtained from patients presenting a well-defined annular thickening in the submucous layer of the anal canal, dense bands of muscle fibres were demonstrated, and the authors conclude that the pecten band is "a palpable manifestation of a well-developed submucosal muscle". They explain how the structure could have been overlooked by previous investigators. In conclusion, Fine and Lawes point out that the relief of symptoms obtained by division of the pecten band may be explained by the assumption that it plays a part in producing or maintaining such morbid conditions of the anus as are associated with a narrowing of the lumen. Such a narrowing of the lumen could arise through spasm of the muscle caused by local irritation (as when a fissure is present), through spasm due to other causes (in some cases of pruritus) or through hypertrophy resulting from chronic spasm or other cause.

Fine and Lawes propose to apply the name "*muscularis submucosæ ani*" to the muscle of the submucous layer. Here again, however, the choice of a name is not a happy one, for the word "*muscularis*" is an adjective, not a noun. The term "*muscularis mucosæ*", commonly used in connexion with the histology of other parts of the alimentary canal, is an elliptical rendering of "*lamina muscularis telæ tunicæ mucosæ*". A simpler name, such as "*musculus submucosus ani*", might more aptly designate the anatomical structure described by Fine and Lawes.

[1] *Klinische Wochenschrift*, January 13, 1940.
[2] *Nature*, June 1, 1940.
[3] *The British Journal of Surgery*, April, 1940.

ECONOMY IN MEDICAL EQUIPMENT.

THE Medical Equipment Control Committee of the Commonwealth of Australia was established under the National Security (Medical Equipment) Regulations which were gazetted on December 19, 1939. Sir Alan Newton, of Melbourne, is chairman of the committee. The object of the committee is to ensure that adequate supplies of medical equipment shall be available for the Navy, the Army and the Air Force and for the requirements of the civil population. Circulars have recently been sent by the committee to medical practitioners asking them to observe strict economy in the use of medical supplies, and at the committee's request attention is drawn in these pages to the need for such economy.

The chairman of the Medical Equipment Control Committee, in conjunction with the chairman of the Central Medical Coordination Committee, has been given wide powers of control. There will probably be no need to exercise these powers, and everyone will agree that wisdom has been shown in the making of an attempt to foster a spirit of cooperation between all users and suppliers of medical equipment. It is hoped that those who have difficulty in obtaining medical supplies will notify the Medical Equipment Control Committee or the State Coordination Committee.

It must be obvious to everyone that difficulty may be experienced in regard to medical supplies and equipment. Before the war many instruments, drugs and dressings and much apparatus were imported from overseas. In some instances supplies will be coming forward, though at long intervals and in smaller quantities than heretofore; in others the source of supply has been cut off and available stocks will have to suffice for Australian needs for some considerable time to come. In these circumstances the strictest economy must be practised; and the committee lays stress on certain specific items. The first mentioned is the drug known as "M & B 693". The demand for this drug is enormous, and it is stated that an adequate reserve must be kept in Australia against the outbreak of pneumonia or cerebro-spinal meningitis either among troops in camp or among the civil population. It is often used in the treatment of conditions suitable for sulphanilamide therapy to the exclusion of other drugs of the sulphanilamide group. The committee states that until an adequate reserve has been obtained "M & B 693" should be used only in those conditions in which it is especially valuable. Since the committee proposes to issue further circulars at a later date, we must presume that the medical profession will be told when a sufficient reserve supply has been accumulated. Glass barrel syringes are not manufactured in Australia and stocks are low. Breakages must therefore be avoided, and the same is true of clinical thermometers. Suture needles and scissors are not made in Australia. Gifts of serviceable surgical instruments no longer required by their owners will be welcome for army use. The committee also describes a method for the reclaiming of surgical dressing gauze.

Abstracts from Medical Literature.

RADIOLOGY.

Tuberculous Tracheobronchitis.

C. B. PEIRCE AND F. C. CURTZWILER (*American Journal of Roentgenology*, February, 1940) call attention to the frequency of tuberculous involvement of the tracheal and bronchial mucosa and discuss the clinical and radiological manifestations. They state that the character of the excavations within the tuberculous lung is of importance. The presence of the tension or "tennis ball" type of cavity is suggestive of intracavitary tension by valvular obstruction of its bronchus; hence theoretically it should be more common in patients with tuberculous bronchitis. The often relatively minor X-ray evidence of parenchymal disease in the presence of advanced tracheal and bronchial tuberculosis must also be emphasized. Here the sputum and the complaints of cough, wheeze and dyspnœa, with more or less cyanosis, are important, and may contraindicate the existence of a minimal lesion diagnosed from skiagrams. Sudden disappearance of sputum or marked fluctuation in the amount of sputum should suggest bronchial block. Varying degrees of airlessness of the lung may occur from rapid progressive loss of pulmonary air content and volume, through fluctuating periodic airlessness to persistent subtotal collapse or complete atelectasis.

Ulcer Niches with Stopper-Shaped Vascular Defect.

AKE AKELUND (*Radiology*, August, 1939) reports six cases of ulcer with niche formation in the stomach, duodenal bulb, descending duodenum, or jejunum, respectively, characterized everywhere by a stationary, stopper-shaped, rounded defect in the centre of the niche, of the thickness of a knitting needle or a match. Although no autopsic verification was available in any of the cases, the author considers himself justified in assuming that the abnormal formation is due to a thickened arterial stump which, in a stopper-shaped manner, projects into the niche from the floor of the ulcer.

An X-Ray Study of the Lungs of Workmen in the Asbestos Industry.

A. GEORGE AND R. LEONARD (*Radiology*, August, 1939) state that in the average uncomplicated case of asbestosis rather consistent and characteristic X-ray findings are present, and until sufficient lung tissue change to be visible on an X-ray film has occurred, the patient will not present any symptoms. There occurs an increased density of the lower lobes of both lungs; this shadow is homogeneous and gives the lung a "ground glass" or "smoky" appearance. The microscopic changes in the lung show that the condition is an almost interstitial fibrosis with areas of atelectasis of the alveoli and smaller bronchioles. There is an absence of the gross nodulation seen in silicosis. What nodulation there is has a fine evenly distributed quality. There are no characteristic changes about the root shadows. Some cases are associated with hilar fibrosis and glandular enlargement; but in many cases of asbestosis there is no variation in the appearance of the hilar shadows. Often there is some accentuation of the bronchial shadows. A peculiar laminated appearance of the bronchial tree in both lower lobes is often found. This peculiar arrangement of the shadows is apparently due to localized areas of emphysema scattered throughout the lower lobes. Changes occur in the pleura, the most constant finding being an accentuation of one or more interlobar pleural septa. The demonstration of pleuritic adhesions of the lower part of the chest on both sides, with obliteration of the costo-phrenic angles, is a rather constant finding in uncomplicated asbestosis. The usual signs of emphysema occur. Dilatation of the right side of the heart is found in a higher percentage of cases of asbestosis than in other forms of pneumonokoniosis, particularly silicosis. There is no evidence to show that asbestosis has any causal relation to tuberculosis. The authors consider that asbestosis is not a progressive disease after the individual has been removed from the dust hazard.

Duodenal Ulcer in the Presence of Symptoms Arising from a Gall-Bladder.

E. J. RYAN (*Radiology*, June, 1940) states that the anatomical relationship, through the circulation and lymphatic distribution, between the gall-bladder and duodenum is made clear by the spread of an inflammatory process and the formation of adhesions between them, through which bacterial emboli may be carried in either direction. An inflammatory process beginning in the gall-bladder may, by extension to the duodenum and by the spasm set up in the pyloric region, so alter the blood supply and function of the duodenum that an ulcer readily forms. An ulcer having its origin in the duodenum may likewise, by extension of its inflammatory process to the gall-bladder, create a cholecystitis with or without the presence of stones. Patients who present some, but not all, of the chief characteristic symptoms of peptic ulcer, and whose condition is suggestive of gall-bladder disease, should be examined not only for a gall-bladder lesion, but should undergo a complete examination of the gastro-intestinal tract.

The Incidence and Significance of Apical Lesions in Pulmonary Tuberculosis.

E. A. ADDINGTON AND B. R. KIRKLIN (*Radiology*, March, 1940) call attention to two structures at the apex of the lungs whose shadows might be confounded with apical scarring on an X-ray film. The first is the shadow of the subclavian artery. This shadow is a homogeneous opacity with a sharply defined lower border, concave downward. It is seen beneath the third rib posteriorly on the left side; however, it may also be seen on the right side. If the skiagram is made with the tube centred over the middle of the chest, the shadow of the artery may be seen closer to the second rib posteriorly. A vertical continuation passing to the aortic arch medially is often seen. The other confusing structure is Sibson's fascia. This fascia extends from the transverse process of the seventh cervical vertebra to the inner margin of the first rib. It is seen only within the arc of the first rib and in the postero-lateral quadrant of the apical cupola. The direction is forward and outward, and rather more antero-posterior than lateral. The visceral margin is sharply defined and is usually slightly concave towards the lung field. The density may be so light as to be hardly visible. The shadow can never be seen to cross the first rib, and on stereoscopic examination it is distinctly not a bony structure.

The Röntgenkymogram in Myocardial Infarction.

M. L. SUSSMAN, S. DACK AND A. M. MASTER (*The American Heart Journal*, April, 1940) have made Röntgenkymographic studies of 200 cases of myocardial infarction. Characteristic abnormalities in left ventricular pulsation were as follows: (i) localized diminution or absence of pulsation, (ii) complete systolic expansion or paradoxical pulsation, (iii) partial systolic expansion, indicated by expansion early in systole or a delay in the completion of systole, (iv) diastolic splintering, as shown by marked irregularities in diastole. These changes were found in 75% of the cases, and are likely to be permanent, although progression and regression have been noted often. A persistently normal kymogram does not exclude the possibility of myocardial infarction. In most cases abnormalities appear within three weeks of the attack, if they appear at all; but occasionally characteristic changes do not appear for several months. Characteristic Röntgenkymographic findings usually permit the making of a diagnosis of myocardial infarction secondary to coronary artery occlusion.

The Use of Hydrochloric Acid in Certain Cases of Atrophy and Delayed Calcification in Fractured Bones.

N. W. CORNELL, A. R. BERNHEIM AND E. C. PERSON (*The Journal of Bone and Joint Surgery*, January, 1939) consider that excessive atrophy of bone and delayed calcification occurring at the site of a fracture are the result of some metabolic or constitutional disturbance affecting the intestinal absorption and subsequent utilization of calcium salts. Their conclusions are based on the following considerations. Absorption of calcium is promoted by factors which tend to keep calcium in solution in the intestine, and *vice versa*. Calcium salts are soluble in acid and relatively insoluble in an alkaline medium. Intestinal acidity is due to hydrochloric acid from the stomach, to fatty acids formed during digestion, and to lactic acid fermentation. Vitamin *D* is also associated with the production of intestinal acidity. The addition of hydrochloric acid (four to eight cubic centimetres of a 10% solution three times a day) to a diet high in calcium and vitamins increases the absorption of calcium and furthers the calcification of bone.

X-Ray Diagnosis of the Strawberry Gall-Bladder.

G. LEVENE, R. M. LOWMAN AND E. G. WISSING (*Radiology*, April, 1940) state that the strawberry gall-bladder empties rapidly, complete disappearance of its shadow occasionally occurring thirty minutes after a "motor meal" consisting of egg yolks and cream, and in most cases emptying will be complete in less than two hours. The average emptying time in a series of twenty strawberry gall-bladders without stones, the absence of stones being confirmed at operation, was one hour and twenty minutes. In the presence of stones emptying may be delayed owing to the ball-valve occlusion of the cystic duct. In a series of ten straw-

berry gall-bladders with stones, the presence of stones being confirmed at operation, the average emptying time was four hours. The average emptying time of the normal gall-bladder was found to be four hours. In chronic cholecystitis without stones there is considerable retention of dye at five hours, and in chronic cholecystitis with stones emptying is still more delayed. Occasionally emptying time of a strawberry gall-bladder with stones may be longer than that observed in association with gall-bladders showing more advanced disease. This is due to the fact that there is greater activity in the strawberry gall-bladder, with consequent greater displacement of stones and hence a greater probability of occlusion of the cystic duct. In either case the gall-bladder shadow may be seen to diminish rapidly in size following ingestion of the "motor meal". During radiological examination the localization of tenderness is ascertained. Tenderness over the gall-bladder is an important element in diagnosis, found in more than 90% of these cases.

PHYSICAL THERAPY.

Deep X-Ray Therapy of Mammary Carcinoma.

W. A. EVANS AND T. LEUCUTIA (*American Journal of Roentgenology*, December, 1939) present (*a*) the results after fifteen years in a formerly published group of cases, and (*b*) a statistical analysis of 1,200 patients treated between 1922 and 1937. In the first part of the article it is noted that of 172 patients suffering from mammary carcinoma of all groups treated by various methods between 1922 and 1924, a total of 51 (30%) survived the five-year period. In the operable group of cases, in which surgery and post-operative irradiation therapy were used, the five-year survival rate was 71% if the carcinoma was localized to the breast proper, and 47% if there was involvement of axillary lymph glands. Of the 51 patients who survived the five-year period, only 24 (14%) were alive at the fifteen-year period. Of the 27 patients who died, 16 died from recurrence of carcinoma or metastases and 11 from other causes. In the operable group, 47% survived the fifteen-year period when the lesion was localized to the breast proper, and 20% when axillary involvement was present. Late recurrences may occur in Stage 1 cases, even after radical surgery and post-operative irradiation, and these recurrences may be successfully treated by irradiation. In the second part of the article all patients treated between 1922 and 1937 are analysed. All who died or were not traced were assumed to have died of carcinoma, so that the survival figures are the lowest possible values. Of the entire group, 830 patients were treated more than five years ago and 434 more than ten years ago. The patients are classified into three groups: (*a*) those treated by a combination of surgery and radiation therapy; (*b*) those to whom radiation therapy alone was applied; and (*c*) those who suffered from recurrences following surgery and who were treated by radiation therapy later on. In each group the cases are divided into stages according to clinical extension and the results in each group are analysed at the end of five and at the end of ten years. One definite conclusion drawn is that in younger women mammary carcinoma does not have a more malignant course than in middle age, though it is true that the malignancy of this type of growth decreases with advancing years in older women. The writers conclude that radiation therapy plays a paramount role in the treatment of mammary carcinoma both as an adjunct to surgery in the operable and as a primary method in the inoperable cases. In the pre-operative or post-operative form it helps to prevent or reduce local recurrences or metastases to regional lymph nodes, and if such complications have already occurred it helps in a great majority of cases to eradicate them. When the supraclavicular lymph glands are involved, radiation therapy not infrequently arrests the progression of the disease for years, and although many of the patients continue to have carcinoma, a great prolongation of life is obtained. In a smaller number of cases an apparent clinical healing with long survival may be produced. In inoperable cases radiation therapy constitutes the sole method of treatment.

Combined Coagulation and Ionization of Cervical Erosions and Endocervicitis.

D. DEROW (*Archives of Physical Therapy*, March, 1940) reports a method of treatment of cervical erosion and endocervicitis that is effective and obviates most of the objectionable features of other methods in use at present. His method consists of two parts: (*a*) coagulation of the eroded areas of the cervix and the lower end of the cervical canal for about a quarter of an inch with the bipolar high frequency current and coagulation of any cysts; (*b*) copper-mercury or zinc-mercury ionization of the cervical canal. Either method alone may effect a cure in some cases, but a combination of the two generally produces a complete and rapid cure. The technique is simple and the author describes the special irrigating ionization electrode which he has designed for the cervix. Differential diagnosis and contraindications are considered and the advantages of the method are described. The report is based on a study of 210 patients who were given this method of treatment. A follow-up study of 180 of these patients showed that most of them obtained complete relief of most of the troublesome local symptoms. Only twelve patients had recurrences.

The Reaction of Carcinomata of the Cervix to Known Doses of X Rays.

H. SCHMITZ (*Radiology*, January, 1940) describes the local reaction occurring in the carcinomatous cervix caused by the application of 800 kilovolt maximum X rays as follows: (i) hyperæmia and capillary injection of the surface mucosa surrounding the cancer on about the seventh to the fourteenth day, corresponding to radiation tumour doses of approximately 1,125 to 2,250 *r* with back-scatter; (ii) the formation of a whitish fibrinous or pseudo-membrane over the mucosa and a flattening out of the carcinomatous ulceration within the next two weeks, corresponding to a local dose of approximately 3,375 to 4,500 *r* with back-scatter; followed by (iii) a blackish green discoloration of the crater or ulcerative part of the growth. During the sixth to eighth week the necrotic area is replaced by granulation tissue and ultimately by epithelialization. Tissue for microscopic studies was removed in 25 consecutive cases before the beginning of treatment and whenever tumour doses of approximately 1,125, 2,250, 3,375 and 4,500 *r* with back-scatter were attained, and thereafter within eight to twelve weeks. Eleven cases had to be excluded, but fourteen cases were free of critical objections. In four of these cases the carcinoma had disappeared at the end of treatment, in three the degeneration of cancer cells was complete, and in seven the carcinoma had assumed renewed activity after a primary marked degeneration of growth. In these seven cases an additional treatment with radium was given. The number of primary cervical carcinomata of all stages treated with the 800 kilovolt Röntgen technique was as follows: 17 cases in 1933; 27 cases in 1934, and 28 cases in 1935. More than three-quarters of the cases are in Stages III and IV. Nine out of seventeen patients, or 52·93%, appear well after five years, seventeen out of thirty patients, or 56·67%, appear well after four years; and thirty-one out of forty-six, or 67·56%, appear well after three years. These survival rates, covering all stages of the disease, are markedly higher than those obtained with other methods of radiation therapy.

Physical Therapy in Infective Complications of War Injuries.

P. BAUWENS (*British Journal of Physical Medicine*, June, 1940) discusses the physical agents which might be of value in the treatment of sepsis in war injuries. The closed method of treatment has found much favour as the result of experience in the Spanish war. Ozone has been used as a deodorizer to overcome the unpleasant odour resulting from the immobilization of limbs in plaster of Paris splints. The more powerful disinfectants favoured some years ago are not used to any great extent in modern war surgery; but reliance is being placed more on ultra-violet rays, oxidizing agents and some dye derivatives. One of the properties of ultra-violet light is that it is lethal to pathogenic organisms on the surface of the body and to the superficial layers of tissue cells. The shorter wave lengths are most effective for this purpose. It has been shown that the bactericidal power of cod liver oil is enhanced by increase of its organic peroxide content. By bubbling ozone through cod liver oil it was found that the available oxygen was increased by over 40%. A method of treatment of a badly infected wound is described. The wound is first cleaned and given a dose of ultra-violet rays, such as would cause blistering of the normal skin; it is then dressed with oxidized cod liver oil. If the wound is deep, it is plugged with "Varicosan" or some suitable substitute. After a lapse of three or four days the wound is once more cleaned, sprayed with oxidized cod liver oil and then given a fourth degree dose of ultra-violet rays. The treatment is repeated every four to six days and a record of the size of the lesion is kept. If the lesion appears to be somewhat indolent, infra-red irradiation should be added to the existing treatment. In deep lesions diathermy and ultra-frequency may be resorted to. Two complications which may arise, erysipelas and progressive gangrene of the skin, are amenable also to physical treatment. The value of X rays in combating deeper and more diffuse infective processes is emphasized by the author.

Special Articles on Psychiatry in General Practice.

(Contributed by request.)

IX.

ANXIETY STATES.

ANXIETY is experienced whenever a strong urge is frustrated so long as the disposition to overcome the obstacle persists. It is also the expression or emotional accompaniment of a conflict between opposing instincts, of the inability to decide between two or more courses of action. The term neurosis may be applied to conditions in which the emotion of anxiety is experienced to a greater degree and with greater distress than circumstances, as judged by average standards, would appear to warrant. In the anxiety neurosis the patient suffers from a state of fear and apprehension either continually or in paroxysms. Whilst many persons have fears or experience a degree of apprehensiveness which seem hardly justified by circumstances, such a state of mind can be termed a neurosis only when there develops a disability, a failure to make a satisfactory adaptation to the psychological environment. In most instances patients have displayed an anxious, worrying disposition for years before a true neurosis appears, and it may be difficult to say when a long-standing disposition shades off into a morbid state. Mental exploration will frequently bring to light a conflict between tendencies subserving the self-preservation (self-expression), sex and social instincts. The problems which the patient is unable to solve most commonly involve matters of morality and self-esteem. There are fears of giving offence or of failure. The Freudian school has gained its notoriety largely through its insistence on the paramount role of the sexual instinct in ordinary behaviour and in the causation of neurosis. Without a doubt this is too narrow a view. But the possibility of a sexual factor should not lightly be dismissed in adolescents and adults. Stimulation without gratification in a manner which is socially acceptable may produce anxiety whether stimulation be of sex or of self-expression. Prolonged engagements and illicit intercourse and the privations of widowhood may be productive of morbid anxiety. Much depends on the upbringing, moral standards and ideals of a person as to how far forbidden practices may be indulged in with equanimity. With regard to widowhood, privation is as often social and economic as sexual. The importance of various contraceptive methods as factors in neurosis has almost certainly been exaggerated. Dissatisfaction arising from inequality in the strength of libido may aggravate neurotic tendencies in husband or wife. The subject of anxiety neurosis may be labouring under some difficulty in his social relationships. The conflict may be between personal ambition and its permissible gratification. It may be that the circumstances in which the patient is placed, his social contacts or his vocation, do not provide adequate opportunities for self-expression. In war the urge to self-preservation and the sense of obligation to the social group struggle for mastery and anxiety states thereby result. It is, of course, unwise to act on the assumption that any particular situation is the cause of a mental conflict. This can be determined only after appropriate mental exploration. Further, it is found that the distressing experience which is suggested by the patient as the cause of his symptoms, most often proves merely to be the breaking point or is made an excuse for evading some issue which may have no clear relation to it. Hence the common mental mechanism of ascribing neurotic symptoms to overwork and to devotion to duty which really arise from a difficult domestic situation or some other circumstance unconnected with the patient's occupation. Not infrequently childhood experiences and early upbringing have caused the patient to be sensitive towards certain situations. For example, the child brought up in an atmosphere of fear and excessively strict discipline may develop a sense of guilt which will seriously affect in later life his attitude towards morality and authority. In such a person the conflict between self-expression and the social instinct may be acute. Sometimes a particular experience leaves a tendency to react with excessive emotion towards some later experience involving the same class of instincts. In this way sexual impulses in adult life may be inhibited or perverted as a result of the unpleasant emotional association persisting in the memory of an early assault. The potential neurotic may for years be loaded with resistances and inhibitions, but maintains an adequate adaptation until physical illness or some particular circumstance, which arouses in him a distressing association of ideas, causes a breakdown in his efficiency and neurosis appears.

Symptoms.

The following symptoms are commonly related by patients with an anxiety neurosis.

Mental Symptoms.—There is loss of concentration; the mind becomes a blank; there is a feeling of unreality and of detachment from surroundings; loss of memory occurs. Such symptoms, which are really due to a deviation of attention from external affairs to the patient's self, his bodily feelings and worries most often lead to secondary fears of insanity and mental dissolution. The disturbed emotional state does actually lead to a temporary mild impairment of cortical efficiency; but the patient places the worst interpretation on his symptoms. Then there are symptoms of a more positive order. These include a heightened sensitiveness to external stimuli (intolerance of noise and light), irritability, restlessness, broken sleep, nightmares. Shyness, embarrassment and hesitant speech, which are apt to be long-standing, almost constitutional, features, tend to become greatly exaggerated when the neurosis develops. Most significant of all is the mental state of fear and apprehensiveness. The anxiety may be "free floating", that is, constantly shifted from one object to another, and varying with each new experience, or it may be attached to some particular topic, such as the fear of insanity, of infection or of apoplexy. In addition to feeling constantly anxious the patient is apt to be overwhelmed by waves of panic (anxiety attacks).

Cephalic Symptoms.—Head pains are common, also the sense of pressure and congestion. These are referred to as headaches, but on further questioning it usually becomes clear that the "headache" is quite different from the bilious or intracranial type. The distinction is important, since the publicity given to cerebral tumours and their treatment of recent years causes both patient and physician to be preoccupied with this possibility. The neurotic head feelings are usually more irritating than painful; but the discomforts which are so often complained of at the sides and back of the head may be due to increased tension of the temporal and occipital muscles and are just part of the general "strungupness" of the anxiety neurotic. Giddiness and still more the fears of falling and fainting, and attacks of a migrainous type are other symptoms whose basis may be essentially emotional.

Voluntary Muscle Symptoms.—Tremors of the fingers are very common, especially during the anxiety attacks. These are due to the disturbance of reciprocal innervation, which, as already mentioned, may affect speech and also the internal viscera. Muscular pains, so often diagnosed as due to rheumatism or neuritis, may result from increased tension, itself a reflection of the patient's mental attitude. "I am so worked up, I can never relax."

Skin Symptoms.—Attacks of "hot and cold" feelings, pallor, dead fingers, flushing, erythema, goose flesh, itching and scratching, tingling, sweating are often mentioned. In some cases the attacks in primarily allergic conditions, such as urticaria and asthma, may be precipitated or aggravated by mental conflict.

Cardio-Vascular Symptoms.—The patient tends to be preoccupied with his cardiac (really precordial) discomforts. He refers a number of symptoms vaguely to the region of the heart, speaks of pain and tension, and may even volunteer the statement that the pain runs down the left arm. Often, and especially when he is trying to settle down to sleep, he becomes acutely conscious of palpitations, flutterings and dropped beats. Apart from the absence of evidence of organic disease, the probability of an emotional basis becomes greater when there are also symptoms referred to other systems. The effort syndrome was a common variety of the anxiety neurosis in the military forces during the last war.

Respiratory Symptoms.—Sense of constriction in the chest, dyspnœa, air hunger, sighing, asthmatic attacks, may be expressive of emotional tension.

Gastro-Intestinal Symptoms.—Dry mouth, loss of appetite and dysphagia may be complained of, or even excessive appetite. The old Anglo-Saxon test of guilt depended on the suspect's inability to swallow dry bread. Nausea and vomiting may be indications of a general nervous tension or of displeasure over some particular circumstance. Flatulence and air swallowing may occasion considerable distress and alarm to the patient. Interference with the gastric secretion, which is very responsive to the emotional state, may produce additional symptoms. Hypertonus of the stomach and hyperacidity may be intensified, if not produced, by long-continued anxiety. Diarrhœa, colic, mucous colitis and colonic spasms with local or diffuse tenderness over the region of the colon, also rectal crises, especially if they occur early in the morning, may be associated with emotional tension.

Genito-Urinary Symptoms.—Frequency and polyuria in attacks, frequent emissions, *ejaculatio præcox* and dys-

pareunia may have an emotional basis. Bourne has called attention to the frequency of an emotional background in the "chronic pelvic woman" who exhibits diffuse tenderness of the pelvic organs without evidence of inflammation.

Henry Maudsley pointed out fifty years ago that: "When emotional excitement is not discharged by motor channels it is apt to affect the internal viscera; it produces a disturbance or unease of them which may increase in degree to disease." It is no exaggeration to say that conflict which remains unresolved at the mental or cortical level is likely to involve lower vegetative centres and to produce an imbalance of the autonomic system.

According to his dominant interests, or to some recent experience, such as the illness of a friend or relative from, say, cardiac disease or insanity, so may the neurotic fix his worries onto his own cardiac or mental condition. In most instances, however, the patient will admit symptoms referable to many bodily systems, even though he comes for advice concerning one only. In the course of mental examination the patient should be asked about all his important bodily and mental functions in order that every bogy may be dismissed from his mind.

Differential Diagnosis.

The presence of cardiac, respiratory or other disease can, of course, be excluded only by physical examination with the addition of such diagnostic aids as may seem indicated. The physician must decide for himself, after considering every aspect of the case, how far there may be a neurotic accompaniment or sequel to an organic disorder. Loss of weight is an early manifestation of many conditions and the possibility of a mental cause should not be overlooked. The history of long-standing nervous symptoms and of an anxious worrying personality will make it likely that recent symptoms are of the same order. On the other hand, organic disease must be excluded with meticulous care when vague symptoms develop in a previously stable personality and there is no recent clear psychological factor.

Tremors occur in hyperthyreoidism, and in mild forms of this condition a differentiation from anxiety neurosis is difficult. So long as treatment remains medical as distinct from surgical, psychological factors should receive attention. Occasionally patients seek advice for "nervousness and shaking", which prove to be part of the Parkinsonian syndrome. The tremors of other organic nervous disease and of intoxication by alcohol, tea, nicotine and other poisons must be excluded.

Psychoses: In the early stages of the schizophrenic, manic-depressive and senile psychoses the patient may for weeks or months exhibit symptoms of morbid anxiety. Above all, in involutional melancholia anxiety is not only an early, but also a persistent feature. One can only observe the progressive depression, the morbid self-depreciation and the development of delusions. The recognition of psychotic features is, of course, of great importance because of suicidal risks. The anxiety neurotic is not suicidal and retains insight, the capacity to cooperate and the desire for recovery. Schizophrenic and senile psychoses exhibit their particular signs of deterioration. Intense apprehensiveness is a feature of *delirium tremens*. Diagnosis from the obsessional neurosis will be considered under that heading.

Treatment.

The treatment of neurosis should begin with the first contact with the patient. The neurotic above all looks to his physician for understanding, encouragement and guidance. Patients will, of course, be encountered whose mentality cannot envisage anything beyond the virtue of a bottle of medicine. A sufficiently cooperative and intelligent patient should first of all be given the opportunity to recite his symptoms with as little interruption as possible. As soon as the physician has got a general impression of the patient's personality and of the nature of his complaints he may proceed to the physical examination, which should be complete enough to justify the assurance that the trouble is not organic. From this stage treatment becomes more definitely therapeutic. After a simple explanation of the effects of emotion on the viscera the patient is questioned concerning worry and anxiety. The psychological or situational factor may be obvious and readily admitted by the patient, in which case appropriate advice may be offered. When the source of conflict is not readily recalled or admitted, the patient should be allowed to discuss himself and his troubles in the course of further interviews. Langdown-Brown has reminded us that the patients should be given a chance of telling us things behind our backs. In the course of two or three interviews the patient should gain valuable insight into the meaning of his symptoms. Explanation, encouragement and direction may be given as occasion demands during these therapeutic talks. If the patient does not then experience relief his case is probably one which requires deeper investigation by a specialist. In most instances mental tension may be reduced by moderate doses of sedative given during the day, while a larger dose at bed-time will render sleep more refreshing. But sedation should not be allowed to be a substitute for adequate inquiry. Sometimes prolonged anxiety will cause actual exhaustion, with loss of weight and a reduction in mental and physical energy. Rest should then be prescribed as a preliminary. Soothing massage and the induction of physical relaxation will promote mental rest. The patient may have to retreat into hospital for a while in order to gain a temporary respite from an irritating situation at home or elsewhere; but the same lines of treatment can be followed. Most patients with anxiety neurosis who are treated in general practice are able to follow their usual occupations or can at least attend the surgery for treatment.

Anxiety States in Children.

Among the more readily recognized symptoms of morbid anxiety in children are fears (although most children have to overcome fear of the dark, of solitude and of the larger animals), irritability, and restless sleep with nightmares. But it is important not to look only for the clinical picture presented by adults, for childhood conflicts and mental uneasiness as often find their expression in tics, twitchings, fidgets, nose-picking and other undesirable habits, and not a little naughtiness and persistent antagonism to authority may be traced to similar causes. Morbid anxiety may also arise from physical disabilities and defects, when the child is unable to compete with his fellows on equal terms and the urge to self-expression is thereby frustrated. "Nervous", "problem" and "difficult" children, most of whom are subjects of anxiety neurosis, can in most instances be handled with very fair success through modification of their environments. Here we have to deal with the all-important factor of the home influences. The fussy, over-anxious, over-solicitous parent is liable to produce emotional tension in the child. The child who has been used to a good deal of attention may suffer severe anxiety if mother-love is lost for any reason. Anxiety is prone to develop in children brought up in a repressive atmosphere with constant fear of punishment. In these a "guilt complex" is apt to produce numerous conflicts, which may continue to interfere with satisfactory adaptations right into adult life. Tension between the parents and unsettled home conditions generally offer threats to the child's craving for security and so lead to anxiety states. The family doctor usually has excellent opportunities for sizing up the home conditions and is therefore in a position to offer suitable advice to the parents. As a rule it is wise, once the child has been physically and mentally examined, to carry out any psychological treatment by directing the parents, teachers and others who may play an important part in the child's upbringing. Sometimes a prolonged visit to relatives when home conditions are unsuitable, or a change of school if the fault lies with the teacher or with undesirable companions, may prove the most suitable treatment. As a rule the nervous child is exquisitely responsive to his environment, and it is by modification of the environment that the child is most easily treated. Exceptional cases will need more specialized handling, including possibly some form of mental exploration.

W. S. DAWSON, M.D., F.R.C.P.,
Professor of Psychiatry, University of Sydney; Honorary Psychiatrist, Royal Prince Alfred Hospital.

British Medical Association News.

MEDICO-POLITICAL.

A MEETING of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, East Melbourne, on June 5, 1940, DR. H. C. COLVILLE, the President, in the chair.

Reorganization of the Medical Profession.

DR. A. E. BROWN read a paper entitled "A Plea for the Reorganization of the Medical Profession" (see page 187).

AIR COMMODORE VICTOR HURLEY, after expressing his thanks to the President, said that he had greatly appreciated Dr. Brown's thoughtful address on a matter of such vital interest. They always expected something refreshing and original in anything he submitted, and that paper was no exception. Dr. Hurley said that he was in agreement with Dr. Brown's main thesis; but the special circumstances of the international situation made it almost impossible to do

anything in a practical way at present. It had been noticeable even before the commencement of the war that the conditions of medical practice were being altered with a rapidly accelerating *tempo*. Various forms of medical insurance, voluntary, compulsory and national, had come under consideration and had aroused considerable discussion; it was apparent that a more efficient and better equipped medical service was required at a cost which should be more evenly and equitably distributed. Dr. Brown's scheme was in effect one of a State medical service, which some might prefer to call State-wide conscription of doctors, or others, mobilization of medical man power. The proposals were really totalitarian in nature and could become effective only if members were prepared to sacrifice certain of their present rights and liberties. There was no question that regimentation on those lines was efficient and was actually carried out in military medical services. If a nation was to conduct war successfully, it could do so only by sacrificing personal freedom temporarily and by adopting totalitarian methods, in which the whole of the national resources, including its medical services, were mobilized. Under peace conditions, however, the benefits of efficiency might be purchased too dearly when efficiency involved sacrifice of freedom of individual thought and action.

Dr. Hurley agreed that any changes that were to be made should come from within the profession itself, as being the body most competent to give advice. Too often in the past, as Dr. Brown had pointed out, lack of constructive thinking and planning by the profession had resulted in the planning being carried out by others less competent, and the results were unsatisfactory both to the community and to the profession. Dr. Hurley went on to say that it was certain that they, as a profession, could evolve a suitable scheme and should do it. The increasing costs of medical services to the general public had been a matter of much concern for years past. The service to patients at public hospitals was in many instances more efficient and thorough than was the case in private practice, in which doctors had so often to bear in mind the expense involved to the individual patient. If the State undertook the payment of the cost of medical service instead of its being the responsibility of the patient, doctors would not have to be worried as to whether the patient could or could not afford what was considered necessary.

Another advantage of Dr. Brown's scheme would be that they could hope that the men fitted for special kinds of practice would be selected. Under existing conditions economic or other circumstances often forced persons to undertake types of work for which they were not specially fitted. In a well-organized and State-controlled medical service there should be fewer square pegs in round holes; each person would be available to be fitted in according to his special qualifications and aptitude, whereas the necessity to earn a livelihood at present deprived many people of those opportunities.

Dr. Hurley then referred to the high standing amongst the public of the name and reputation of the profession, and the increasing and favourable prominence given to medical matters in the Press, in the moving pictures and in current literature. Most people regarded their doctor as a specially skilled, trustworthy person, able to discuss with them not only their medical, but their personal and private troubles as well. It could be safely predicted that the services of medical people would play an ever-increasing part in the affairs of the community. Dr. Hurley also regarded it as inevitable that the end of the honorary medical system in public hospital life in its present form must come in the very near future. He remarked that, though the free choice of doctor by patient had always hitherto been a cardinal feature of medical policy, it probably would not be possible in Dr. Brown's scheme. In public hospitals and in the services that choice was not possible, and its absence was not manifestly disadvantageous and need not be an obstacle to the development of the scheme. With reference to Dr. Brown's views on the selection of students, Dr. Hurley expressed the opinion that some degree of choice or selection as to the type as well as to the number of medical students accepted for training was overdue; the difficulties of the universities, with limited accommodation and equipment, in trying to cope with an unlimited number of students were becoming increasingly great. In conclusion, Dr. Hurley repeated that they could hardly be expected to settle down at the present time to careful planning for the future, but that when the situation clarified itself a serious effort should be made within the profession to do so.

DR. JOHN DALE said that he had listened to Dr. Brown's proposals with great interest and respect, and he was sorry that he could not agree with him on some important points in both his premises and his conclusions. It was obvious, certainly, that they lived in a changing world; that statement seemed to be putting it mildly. A host of variables had affected, were affecting and would affect the conditions of medical practice. Possibly the changes had recently been, and tended to be, for the worse, although Dr. Dale suggested that distance and Dr. Brown's own personal experience might have lent an undue enchantment to the "halcyon days" of private practice; and it might be that if, by the organization of the medical profession with no interest other than the public welfare, conditions of medical practice could be improved, the attempt should be made. But Dr. Dale did not think they could.

Dr. Dale particularly stressed the fact that he had not said "reorganizing the profession"; his point was that it had never been organized. Dr. Brown said that it had. He had spoken of their national medical organization; an existing medical system, in the same way that they were all trapped into speaking of the social system, the economic system, the industrial system *et cetera*, suggesting, quite wrongly suggesting, design and planned arrangement of what were in fact ever-changing conditions, relationships and states of affairs much more chaotic than systematic. Medical system indeed! What they had in fact were doctors practising under all sorts of very different and changing conditions, and a host of pharmacists, quacks and patent medicine vendors "going for their lives" too, under similar changing conditions. Dr. Dale emphasized this protest because Dr. Brown, assuming that it had been or was organized, seemed to take for granted or accept as inevitable the national reorganization with which, as he had said, the medical profession was threatened.

Dr. Dale admitted that under the stress of the present crisis the whole of national life was likely to be planned by a central government. Things had been going that way (Russia, Italy, Germany, all were centralized dictatorships), and even the so-called democracies were gradually being planned and brought under centralized control through the Bank of International Settlements at Basle, to which the central banks of many States were affiliated and subservient. And in the present war all would have to give, for the time at least, much more power to the central governments. But did anyone in his senses think that centralized control or dictatorship was desirable or to be accepted, except temporarily, in dire emergency? It was the negation of freedom and of the hope of increasing liberty. That free men should associate and agree to arrange and organize their work to the common advantage was surely excellent; but that they should surrender liberty and be organized as State servants was surely to be avoided at all costs, possibly even in the emergency of war.

Dr. Dale went on to say that Dr. Brown had suggested that the conditions of medical practice had been deteriorating and that this could be remedied by the organization of the medical profession under centralized control. What Dr. Dale wanted to suggest was that the deterioration, the insecurity, the anxiety and the frustration of the medical profession were only an aspect (their appreciation) of the general insecurity and anxiety which had been afflicting Western civilization as a whole over the last few decades. The present did seem to be the end of an epoch. They should consider the conditions of Western civilization at the present time; the frustrations and contradictions; the unemployment, the unwanted outcast multitudes, poverty amidst plenty (no idle phrase); the birth rates fallen to disappearance level; the very real growth of international appreciation and goodwill faced with the dreadful threat and final onrush of Armageddon. Could the medical profession expect to be secure and to be giving increasingly effective and satisfactory service under such conditions? And would all be well if they had their poor selves organized? Not by any means!

Dr. Dale went on to say that he was not opposed to all Dr. Brown's ideas, and he thought that in so far as they must submit to organization, it was most important that they strive for professional control of the medical services and for the preservation of their standards, ethics and traditions in the interests of the public welfare. But he found no reason, even in the present situation, why the whole profession should bow down before the Moloch of national organization and central planning. It had not happened in England, where organization had gone much farther than in Australia.

Dr. Brown's idea that they could decide just how many doctors the people ought to have, that they should select and train them and place them in well-paid and secure positions, in the manner of the Indian medical service, struck Dr. Dale as fantastic. Dr. Brown was troubled, as they all were, as to how far and in what manner the doctors of his ideal service were to practise preventive medicine. In that connexion Dr. Dale suggested that the prevention of disease would be brought about in the future mainly by social and economic changes and by the improvement of education in its widest sense. Finally, Dr. Brown was concerned about the cost of his medical service, and suggested the inevitability of loans and taxation and their limitations. In other words: where was the money to come

from? Not "where were the knowledge and skill to come from, with the immense interest of their exercise?" Not "where were the materials to come from?"—the buildings, the instruments, the chemicals, the X-ray plants and what not, with the fascination of their design, manufacture and elaboration. No, Dr. Brown knew where they could be found and produced in abundance. Dr. Dale asked: "Where, oh where was the money to come from?" Where were the figures in books to come from? In other words, who was to write those figures, under what conditions, and in whose interests? Until they had solved those questions satisfactorily they had no hope of a better medical service or of solving those major problems to which Dr. Dale had referred. And so Dr. Dale concluded with the words: "Poor Dr. Brown, and poor most of you, and, indeed, poor all of us!"

DR. D. O. ROSEBY, after referring briefly to the book by Mr. and Mrs. Sidney Webb, entitled "Health and the State", recalled that from time to time papers on national medicine had been written for the Branch—for example, by Sir Harry Allen and by Dr. J. Newman Morris. Dr. Roseby had listened eagerly to Dr. Brown's outline of what should be, and had noted his appeal to the leaders of the profession to take an interest. Dr. Roseby had through the years on many occasions taken part in conferences with outside bodies on behalf of the profession, and had come to the conclusion that the general public wanted a cheap medical service rather than a good one; in the past all the altruistic ideas seemed to have been fostered inside the profession and were not shared by the public outside. He mentioned that one of his bitter memories was that though the lodges were paying the miserable pittance of 14s. *per annum* per member, the medical officers had been refused a rise of 1d. a week and had had to resign their appointments before getting that rise.

Dr. Roseby had also made inquiries about the state of medical practice in central European countries that had national services, all carefully planned, with specialists, sanatoria and other special features; the health of the population was not improved by them, because nothing else moved *pari passu*; bad housing, malnutrition, unemployment and poverty were allowed to continue in operation alongside the national health service, and militated against any benefit. Dr. Roseby thought that Dr. Brown's paper really raised the whole question of communism and cognate subjects. The medical profession could not and should not march out of step with the rest of the community; people working in poverty could not attain the condition of satisfactory health; while governments allowed poverty to remain, the medical profession was hamstrung.

Dr. Roseby then went on to say that he was afraid he had not much confidence in governmental boards and control, and would not like to support a scheme without having confidence in the appointing and directing bodies. It was difficult for him also to conceive how it was to be possible to get away from the usual conditions of public service, such as working for forty hours or so a week. Doctors were expected to be always on hand; regulated hours would increase the cost and make the scheme very complicated to work. Finally, Dr. Roseby feared that if the scheme was initiated and proposed by the profession the *bona fides* would be questioned by the parties treating for the general public.

Dr. Brown, in reply, said he thought that on the whole those taking part in the discussion had been kind to him. He was rather afraid of labels and preferred to look at a thing for what it was; but in any case he disclaimed "totalitarianism" as a label for his scheme. The idea of gradual accommodation to changing circumstances was all very well if they had the time to keep pace with outside thrusts; but he felt that it would probably be better to take charge and to control the changes. The increasing costs of medical services to which Dr. Hurley had referred were at present thrown on patients either directly as individuals or indirectly through charity grants or in other ways. Dr. Brown reinforced what Dr. Hurley had said about the freedom of choice of doctor by saying that in his experience many people seemed to prefer the service of the out-patient department of a public hospital to private medical attention, and did not feel the lack of free choice of doctor that that practice entailed. Moreover, he understood that there were 111 one-man towns in Victoria, and the patients of those doctors could not exercise a free choice. In fact, the number that enjoyed that freedom was not so very great at present and was becoming smaller as time went on.

In reply to Dr. Dale, Dr. Brown explained that he had used the word "system" euphemistically; any centralized control rather than the state of *laissez-faire* was an improvement, whether in a "dictator" country or in any other. He really thought that it would be possible to forecast with reasonable accuracy the numerical requirements in terms of medical students. He reminded Dr. Dale that he had expressed himself as not concerned about the cost of his scheme, though he did think they should stick out for principles.

In reply to Dr. Roseby, Dr. Brown, with reference to the results of control of the profession in Europe, said that as the whole system of ethics was different, the situations were not comparable. Even if those schemes had failed, it might be possible to evolve a successful scheme in Australia; incidentally, he reminded Dr. Roseby that in no country had there been any reversion of policy once a national medical service had been established. Finally, he said that if poverty and its concomitants were the greatest enemies to the maintenance of health, there was no excuse for dealing with them with inefficient organization and poor instruments. Proper organization of the profession would give added strength to the overcoming of those evils. Dr. Roseby had struck him as belonging to the type of person who would go so far as to admit that something should be done, but would not undertake to plan for the doing of it.

DR. H. C. COLVILLE, from the chair, after closing the discussion, made a statement concerning certain aspects of the military situation as it affected the profession. He regarded the organization of the profession for war purposes as the chief function of the Branch executive in war-time, and considered that peace-time activities must be made subservient to that objective. They had encountered a difficulty in knowing in what direction their duties lay as individuals or as a whole. It would be remembered that at the preceding monthly meeting of the Branch Dr. Colville had invited Major-General Downes to name the requirements of the army medical directorate upon the Branch executive. He took the opportunity of informing members that that invitation had been accepted and that the Branch executive had already been asked to take certain action in the matter of the medical examination of recruits. Up to the present time that work had been done chiefly by reservists; but, owing to the great increase in recruiting, the time had arrived when some appeal had to be made for assistance. As President of the Branch he had been asked to see what could be done about it. He announced, therefore, that a circular was going out from him inviting the members to volunteer to give up one half-day per week to work in the capacity of medical examiner of recruits in the metropolitan area. He had every confidence that the response would be satisfactory; what he had asked of the members was really only a small contribution in the time of the nation's need, but none the less it would be a very valuable one.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 161, of August 15, 1940.

PERMANENT NAVAL FORCES OF THE COMMONWEALTH (SEA-GOING FORCES).

Extension of Appointment.—The appointment of Surgeon Lieutenant Walter Mario Butler is extended for a period of two years from 16th August, 1940.

AUSTRALIAN IMPERIAL FORCE.

Australian Army Medical Corps.

To be Colonels.—Lieutenant-Colonel R. A. Money, M.C., E.D., Unattached List, 2nd Military District, and to command the 6th Australian General Hospital, and Colonel W. E. Summons, O.B.E., V.D., Reserve of Officers, 3rd Military District, and to command the 7th Australian General Hospital, 1st July, 1940. *To be Lieutenant-Colonels*—Lieutenant-Colonels J. C. Belisario, Australian Army Medical Corps, 2nd Military District, and to command the 2nd/3rd Casualty Clearing Station; E. M. Sheppard, Australian Army Medical Corps, 2nd Military District, and to command the 2nd/10th Field Ambulance; Majors (Temporary Lieutenant-Colonels) H. F. Summons, Australian Army Medical Corps, 3rd Military District, and to command the 2nd/9th Field Ambulance; and J. G. Hayden, Australian Army Medical Corps, 3rd Military District; Lieutenant-Colonel J. R. M. Beith, Reserve of Officers, 2nd Military District, and to command the 2nd/1st Hospital Ship, 1st July, 1940.

To be Lieutenant-Colonel.—Major B. S. Hanson, and to command the 2nd/8th Field Ambulance, 1st July, 1940.—(Ex. Min. No. 151—Approved 14th August, 1940.)

AUSTRALIAN MILITARY FORCES.

NORTHERN COMMAND.

First Military District.

Australian Army Medical Corps Reserve.

Reserve of Officers (A.A.M.C.).—To be Captain (temporarily)—Lieutenant H. W. Powell, 1st June, 1940. *To be Honorary Captain*—Luther Morris, 29th April, 1940.

EASTERN COMMAND.

Second Military District.

Australian Army Medical Corps Reserve.

Honorary Captain J. S. Harris is retired.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

The following are granted commissions on probation with the rank of Flight Lieutenant, with effect from the dates indicated: William Peter Harvey Dakin, M.B., B.S., Arthur Lloyd Kennett, M.B., B.S., 24th June, 1940; Geoffrey Wyndham Davies, M.B., B.S., Charles Alister McHardy, M.B., Ch.M., and Harold Crowcombe Stone, M.B., B.S., 1st July, 1940; Winifred Lambert Fowles, M.B., B.S., 4th July, 1940; Eric James Davies, M.B., B.S., and Vernon Stuart Howarth, M.B., B.S., 8th July, 1940.

The following Flight Lieutenants are transferred from the Reserve to the Active List, with effect from the dates indicated: C. R. E. Downing, M.B., Ch.B., F.R.C.S. (Edin.), 3rd June, 1940; W. McL. Borland, M.B., B.S., 1st July, 1940; and R. G. Weaver, M.B., B.S., 8th July, 1940.

The notification appearing in the *Commonwealth of Australia Gazette*, dated 4th July, 1940, concerning William Peter Harvey Dakin, M.B., B.S., is cancelled.

The following are granted commissions on probation with the rank of Flight Lieutenant, with effect from the dates indicated: Henry Whitaker, M.B., B.S., 15th July, 1940; John Murray Alexander, M.B., B.S., Leonard Telford Conlon, M.B., B.S., William Thomas Coyle, M.B., B.S., Kenneth Hamilton Hill, M.B., B.S., James Isbister, M.B., B.S., Maurice Morris, M.B., B.S., and Alva Thomas Pearson, M.B., B.S., 22nd July, 1940.

Flight Lieutenant J. G. Brown is transferred from the Reserve to the Active List, with effect from 15th July, 1940.

The notification appearing in the *Commonwealth of Australia Gazette*, dated 4th July, 1940, concerning Maurice Morris, M.B., B.S., is cancelled.

The appointment of Squadron Leader F. J. Clark is terminated, with effect from 22nd July, 1940.

John Clive Sangster, M.B., B.S., is granted a commission on probation with the rank of Flight Lieutenant, with effect from 10th July, 1940.

Reserve: Medical Branch.

The following are granted commissions on probation with the rank of Flight Lieutenant, with effect from 15th July, 1940: Hugh George Allen, M.B., Ch.M., F.R.A.C.S., and Kenneth Arthur McLean, M.C., M.D., B.S.

Flying Officer F. T. Humphery is transferred from the General Duties Branch to the Medical Branch with the rank of Flight Lieutenant, with effect from 22nd July, 1940.—(Ex. Min. No. 53—Approved 14th August, 1940.)

Nominations and Elections.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Maclurkin, Iver Douglas MacArthur Brodie, L.R.C.P., L.R.C.S. (Edinburgh), L.R.F.P. and S. (Glasgow), Somerville.

The undermentioned has been elected a member of the New South Wales Branch of the British Medical Association:

Buckle, Donald Fergus, M.B., B.S., 1933 (Univ. Melbourne), Mental Hospital, Stockton.

Obituary.

SYDNEY STEWART SHIRLOW.

WE regret to announce the death of Dr. Sydney Stewart Shirlow, which occurred on August 21, 1940, at Sydney, New South Wales.

DONALD FRASER.

WE regret to announce the death of Dr. Donald Fraser, which occurred on August 25, 1940, at Sydney, New South Wales.

Medical Appointments.

Dr. A. M. Mocatta has been appointed Honorary Anæsthetist at the Royal Adelaide Hospital, Adelaide.

* * *

Dr. R. H. Elix has been appointed Temporary Honorary Assistant Physician to the "Mareeba" Babies' Hospital, Adelaide.

* * *

Dr. B. A. Warner has been appointed a Medical Officer to the Ante-Natal Clinics and Venereal Diseases, pursuant to the provisions of *The Public Service Acts*, 1922 *to* 1924, and *The Health Acts*, 1937 *to* 1939, of Queensland.

Diary for the Month.

SEPT. 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
SEPT. 3.—Federal Council, B.M.A.: Meeting at Sydney.
SEPT. 4.—Victorian Branch, B.M.A.: Branch.
SEPT. 4.—Western Australian Branch, B.M.A.: Council.
SEPT. 5.—South Australian Branch, B.M.A.: Council.
SEPT. 6.—Queensland Branch, B.M.A.: Branch (Jackson Lecture).
SEPT. 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
SEPT. 10.—Tasmanian Branch, B.M.A.: Branch.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associate Friendly Societies' Medical Institute; Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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